The RUBBER AGE

March, 1942

"S"
A light-colored material developed for use in the loading and plasticizing of the Butadiene type
SYNTHETIC RUBBERS
Fast mixing and dustless. Requires little or no additional plasticizer. Good for smooth calendering and tubing
R. T. VANDERBILT CO., INC.
230 Park Avenue, New York City

Newsletter No. 3 *PUBLISHED BY RUBBER CHEMICALS DIVISION OF* DU PONT *MARCH 1942*

Improved Reclaimed Rubber Compounds Possible by use of Accelerator 808 or Thionex

TRUE CONSERVATION in the Rubber Industry means more than the mere substitution of reclaimed for crude rubber in existing compounds. While more reclaimed and less crude rubber must now be used, it is vitally necessary to compound and vulcanize the mixture in such a way that the finished product will have the longest possible service life.

The quality of products containing substantial amounts of reclaimed rubber depends on the quality of the reclaim and to a large extent upon the vulcanization accelerators used. From the standpoint of background information, economy and probable availability, the two best accelerators for compounds containing large proportions of reclaimed rubber are Accelerator 808 and Thionex.

ACCELERATOR 808 is the familiar aldehyde-amine type accelerator identified chemically as a condensation product of butyraldehyde and aniline. It has long been recognized as an outstanding accelerator for stocks containing reclaimed rubber.

When vulcanized with Accelerator 808, stocks containing reclaimed rubber have a very rubbery, snappy feel and age exceptionally well. As clay inhibits vulcanization of 808 accelerated stocks, Thionex is recommended as the accelerator in compounds containing high loadings of clay.

BASE TEST COMP.	1	2
Smoked Sheets	45.	45.
Whole Tire Reclaim	100.	100
Zinc Oxide	5.	5
York Whiting	58.	—
Crown Clay	—	56.
Stearic Acid	2.	2.
NEOZONE A	1.	1.
Acceleration	as shown	as shown
Sulfur	3.3	3.3

THIONEX, a well-known thiuram type accelerator identified chemically as tetramethyl-thiuram-monosulfide, has been widely used for years in the production of quality rubber goods. At the present low price, Thionex is very economical to use and is the best all-round accelerator for stocks containing a large proportion of reclaimed rubber. To improve processing safety, litharge should generally be used with Thionex. When used in approximately the same amount, litharge moderately retards the cure of Thionex accelerated stocks at low temperatures but has no effect at curing temperatures of 258°F. and above.

TEST DATA: The accompanying data illustrate the value of Accelerator 808 and Thionex in stocks containing reclaimed rubber. The base recipes for the compounds tested are shown at the left below.

CONSERVATION OF NEOPRENE Cements made from Neoprene Types GN or CG have excellent storage stability when compounded with normal amounts of magnesia and zinc oxide. However, some cements specially compounded or accelerated to cure at room temperature are quite unstable. If a neoprene cement becomes stringy and livery, or even fully gelled, it may be peptized to a usable viscosity by the addition of Accelerator 552, small quantities of which may be added to the cement in the form of a 20% solution in benzol. For partially gelled cements 0.25% to 1.0% of Accelerator 552 on the neoprene content of the cement is generally sufficient. For completely gelled cements, 1.0% to 5.0% Accelerator 552 on the neoprene is required.

Conservation of neoprene through recovery of stringy or gelled cements by these methods is discussed in detail in a recent report entitled "Peptization of Partially and Completely Gelled Neoprene Cements."

PHYSICAL TEST DATA

PRESS CURE 15 MIN. AT 287°F.

Acceleration	Amount	Accelerator Cost	Base Comp.	Stress at 400% El.	Tens. Str. p.s.i.	El. at Break %	Hardness Shore	Oxygen Bomb* Aged 5 days % Tens. Str. Retained	Oven Aging** 10 days % Tens. Str. Retained
Accelerator 808	0.5	$ .31	1	700	1500	600	45	67	95
Accelerator 808***	0.5	$ .31	2	—	—	—	—	—	—
Thionex	0.18	$ .28	1	750	1500	570	47	53	90
Litharge	0.18								
Thionex	0.18	$ .28	2	1225	1925	515	50	59	88
Litharge	0.18								

* *Exposed to oxygen at 300 p.s.i. and 70°C.*
** *Geer Oven. Exposed to circulating air at 70°C.*
*** *No cure due to retardation of clay.*

Through the Mill

NEOPRENE TYPE ILS *is an improved form of Neoprene Type I. As indicated by the initials "ILS," the new material has even Lower Swell in oils and solvents than Neoprene Type I. Neoprene Type ILS may be directly substituted in present Type I compounds without any other change in the formula. In comparison with Type I, Neoprene Type ILS vulcanizates swell less and retain a greater percentage of original tensile strength after immersion in solvents. They have higher tensile strengths and elongations at break, better resistance to heat and oxidation; equal water resistance, resilience, compression set, and tear strength. Neoprene Type ILS will be supplied in the future on all orders calling for Type I.*

BRRR! *A double texture fabric combined and coated both sides with a high grade neoprene compound cracked on creasing at −90°F. It did not crack at −80°F.*

THE FOLLOWING *recently published informal reports are available on request. Just drop us a line on your company letterhead stating which ones you wish:*

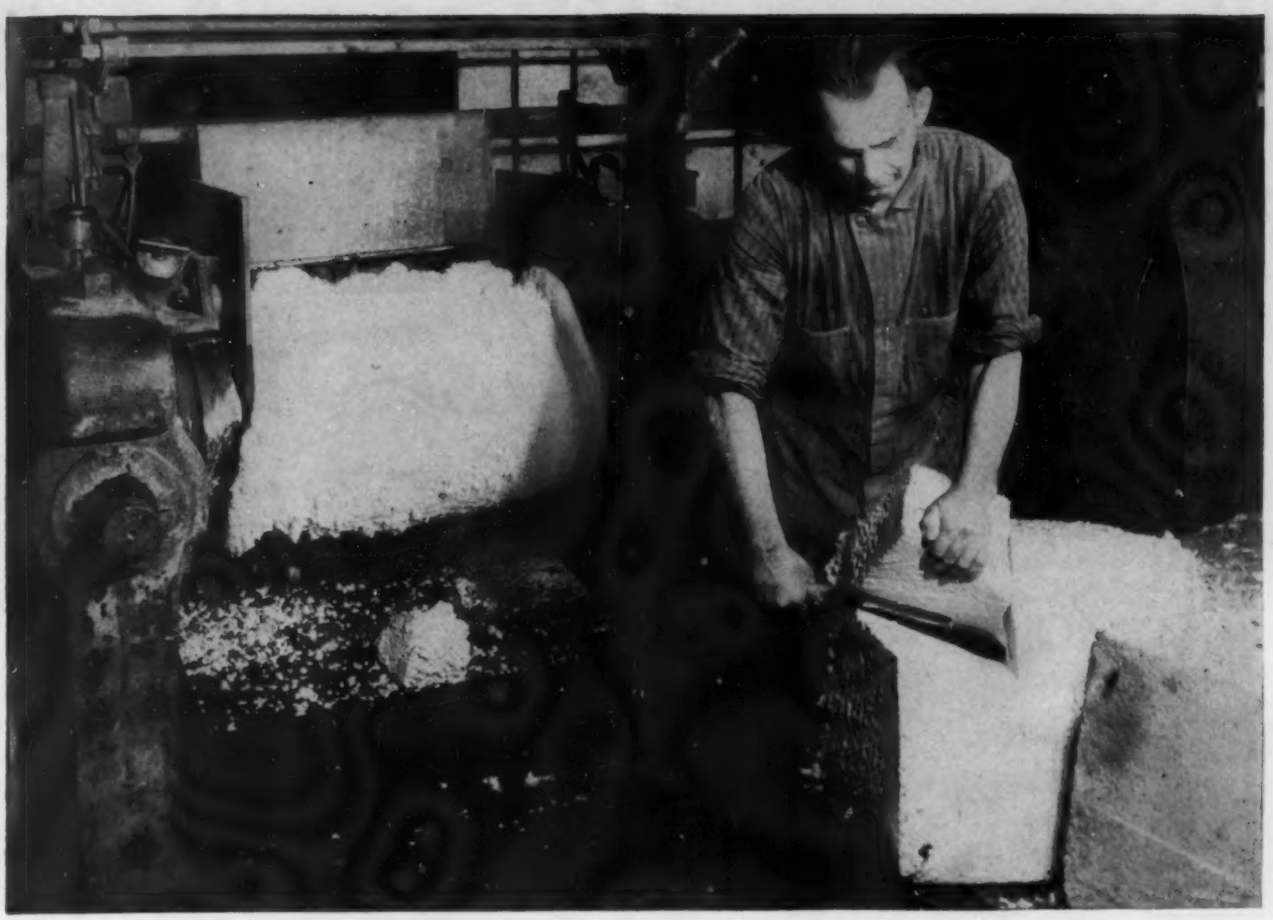
1. *Freeze Resisting Rubber Compounds.*
2. *The Effect of Reclaim, Tread Buffings, Mineral Rubber and Pine Tar on the Rate of Wear of Tread Stocks Used for Recapping Tires.*
3. *Abrasion Resistance of Neoprene Jacket Stocks.*
4. *Solvents for Neoprene Cements.*

RUBBER CHEMICALS DIVISION

Wilmington DU PONT *Delaware*

REG. U. S. PAT. OFF.

THE RUBBER AGE, published monthly by The Palmerton Publishing Co., Inc., Printing Office, East Stroudsburg, Pa. Editorial and Advertising Offices at 250 West 57th Street, New York, N. Y. Entered as second class matter October 20, 1933, at the Post Office at East Stroudsburg, Pa., under the Act of March 3, 1879. Subscription in United States, $3.00 a year. Canada, $3.50; Foreign, $4.00. March, 1942. Vol. 50, No. 6.



A chip off a brand new block

Piece by piece a new block of Hycar is going on this wash mill to be sheeted. Then the sheets will be dried and packed for shipment to . . .

To whom? Just who uses Hycar? What do they produce with it? And why Hycar, particularly?

Progressive, forward-looking rubber processors throughout the country are using Hycar in steadily increasing quantities.

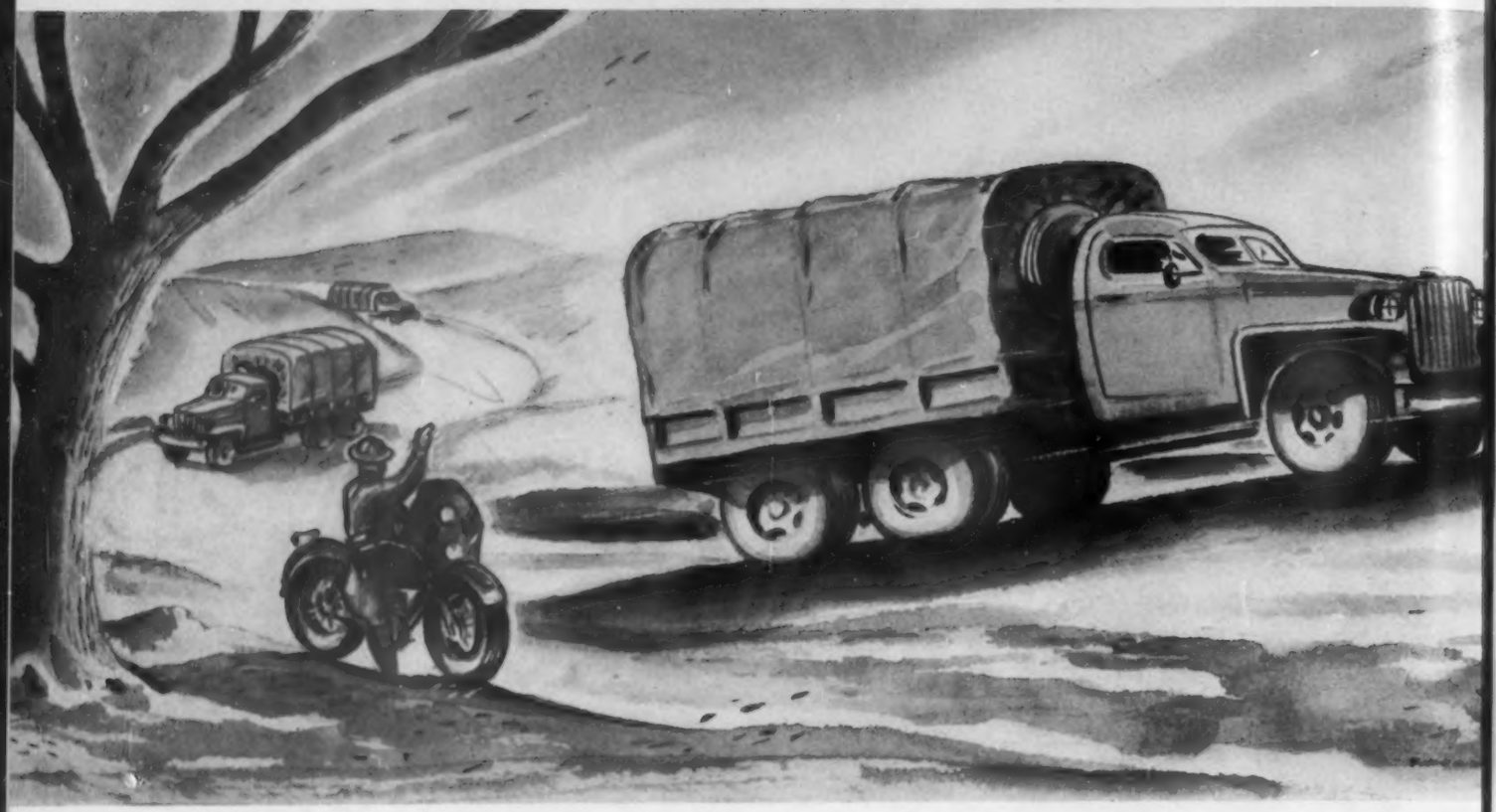
They are using it to make all manner of products for aircraft, for machinery, for the petroleum industry—to name just three of the most intensely active phases of our war production. Further, their engineers and ours are discovering important new uses almost daily.

They selected Hycar—for its extreme resistance to oil, to gasoline, to abrasion and heat; its resistance to aging and deterioration. They selected Hycar for its light weight compared with other synthetic rubbers, for its resisance to cold-flow, its low compression set. They chose it too for its ability to be molded, extruded and otherwise fabricated on the same machinery as natural rubber without re-training personnel.

Like all other resilient materials, Hycar is subject to allocation by WPB, but with productive capacity now doubled, many more requests can be taken care of than formerly. Our engineers are ready to give you every technical assistance.

HYCAR CHEMICAL COMPANY
AKRON • OHIO

OUR ARMED FORCES ROLL ON RUBBER



KEEP YOUR PRODUCTION *Rolling*

with CLIMCO PROCESSED LINERS

★ In the past twenty years Climco Processing has been recognized throughout the rubber industry as an important method of reducing costs in the handling, storage and separation of uncured stocks. ★ Today Climco Processing is of even greater importance, because it helps meet the urgent demand for more and faster production. By eliminating stock adhesions, speeding-up separation, and keeping the liners in uninterrupted service for a longer time, Climco Processing saves valuable time, as well as reducing the cost of labor, power, and liner replacements. ★ For faster and more uniform production, it pays to have your liners Climco Processed. Write now for a detailed explanation of the advantages of Climco Processing.

CLIMCO

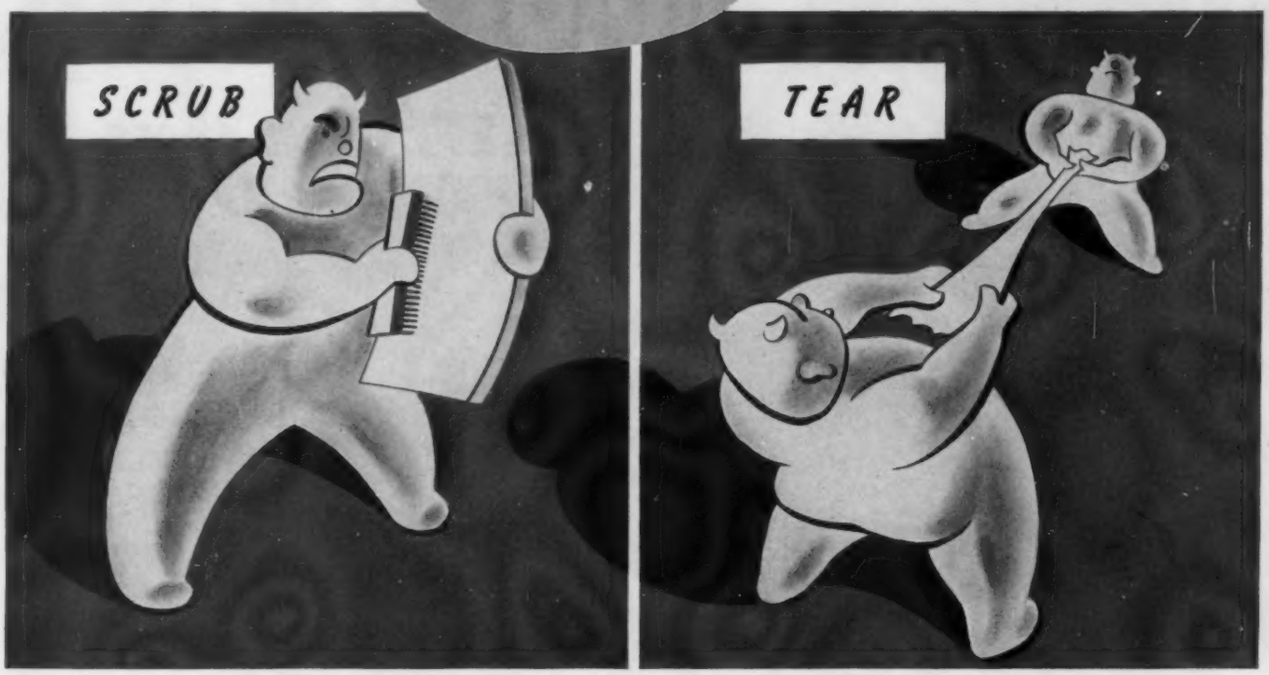
LINERETTE
INTERLEAVING PAPER
Treatment Contains
NO OIL OR WAX
Samples on Request

THE CLEVELAND LINER & MFG. CO.
CLEVELAND, OHIO

CLIMCO PROCESSED LINERS

For Faster, Better Production at Lower Cost

MEET A COUPLE OF ENEMIES OF LONG LIFE FOR RUBBER



You encounter them every day, wearing and tearing at your products. You've done wonders toward defeating their efforts. Now, C-700 Hydrated Aluminas step into the picture, as reinforcing pigments, to help you make the rubber we have last longer.

Rubber has these very desirable properties when C-700 Aluminas are used:

1. Good resistance to abrasion.
2. Unusually high resistance to hot and cold tear.
3. Low heat build-up and good heat transfer.
4. Superior aging characteristics.
5. Translucence of pigment, imparting no color to rubber, and permitting color in products hitherto limited to black.
6. Good dielectric properties.
7. High modulus with high elasticity.
8. Low specific gravity.
9. Unusually good tackiness of uncured stock.
10. High resilience and rubbery properties, with high pigment loading.
11. High strength at elevated temperatures.
12. No odor imparted by pigment.

Whether you're making tires, insulation for wire, rubber heels, or gas masks, you should investigate the use of C-700 Hydrated Aluminas as reinforcing pigments. May we send you a sample for trial? ALUMINUM COMPANY OF AMERICA (*Sales Agent for* ALUMINUM ORE COMPANY) 1970 Gulf Building, Pittsburgh, Penna.

Reg. U. S. ALORCO Pat. Off.

ALUMINUM ORE COMPANY

ALUMINUM AND FLUORINE COMPOUNDS

TO SPEED RUBBER RECLAIMING

BARRETT offers these COMPOUNDING MATERIALS

1. BRV* For pan reclaiming tire peels and similar tire scraps. Sometimes used with Reclaiming Oil 1621.

2. BARDEX* For pan reclaiming light gravity and tube scraps.

3. RECLAIMING OIL NO. 1621 For digestor reclaiming of whole tire or like scraps.

Barrett

THE BARRETT DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 RECTOR STREET, NEW YORK

Barrett Chemicals for the Rubber Industry: Carbonex*... Carbonex*S ...Carbonex*S Plastic ...Cumar*... Bardol*... Bardol*B ... Bardex*... B.R.H.* No. 2 ... B.R.T.* No. 7 ... B.R.V.*... S.R.O.*... Reclaiming Oil No. 1621...B.R.C.* No. 19E...Dispersing Oil No. 10...Resin C* Pitch
*Trademark Reg. U. S. Pat. Off.

ONE OF AMERICA'S GREAT BASIC BUSINESSES

Short and to the Point

Ask any consumer of St. Joe lead-free Zinc Oxides—or any score of them—what they think of our products, and they will tell you that the quality of the products and service we give them justifies the orders they give us.

ST. JOSEPH LEAD COMPANY
250 PARK AVENUE, NEW YORK, N. Y.

MADE BY THE LARGEST PRODUCER OF LEAD IN THE UNITED STATES

USMC Lining Trimming Machine
Model B

USMC Lining Trimming Machine

Model B

THE USMC Lining Trimming Machine—Model B, is especially designed for trimming the surplus lining of Rubber Boots, Pacs, Lumbermen's Boots and Gaiters.

This machine not only insures uniform trimming, but does the work more economically than any other method.

It has an individual motor drive and is portably mounted allowing the work to be handled efficiently.

A number of these machines are being used in various Rubber Footwear Factories with excellent results.

Machines are sold outright.

Write to the nearest branch for prices and further particulars.

United Shoe Machinery Corporation

BOSTON, MASSACHUSETTS

Atlanta, Ga.....29½ Pryor, N. E.
Auburn, Maine.....38 Minot Ave.
Brockton, Mass.....93 Centre
Chicago, Ill.....500 South Franklin
Cincinnati, Ohio.....407 East Eighth
Haverhill, Mass.....145 Essex
Johnson City, N. Y.....19 Jennison Ave.
Lynn, Mass.....525 Union
Milwaukee, Wis.....922 North Fourth
New York, N. Y.....110 Fifth Avenue
Philadelphia, Pa.....221 North 13th
Rochester, N. Y.....60 Commercial St.
St. Louis, Mo.....1423 Olive
San Francisco, Calif.....859 Mission
Worcester, Mass.....71 Mechanic

RUBBER SULPHURS

COMMERCIAL RUBBERMAKERS' SULPHUR
TIRE BRAND, 99½% PURE

•

REFINED RUBBERMAKERS' SULPHUR
TUBE BRAND, 100% PURE

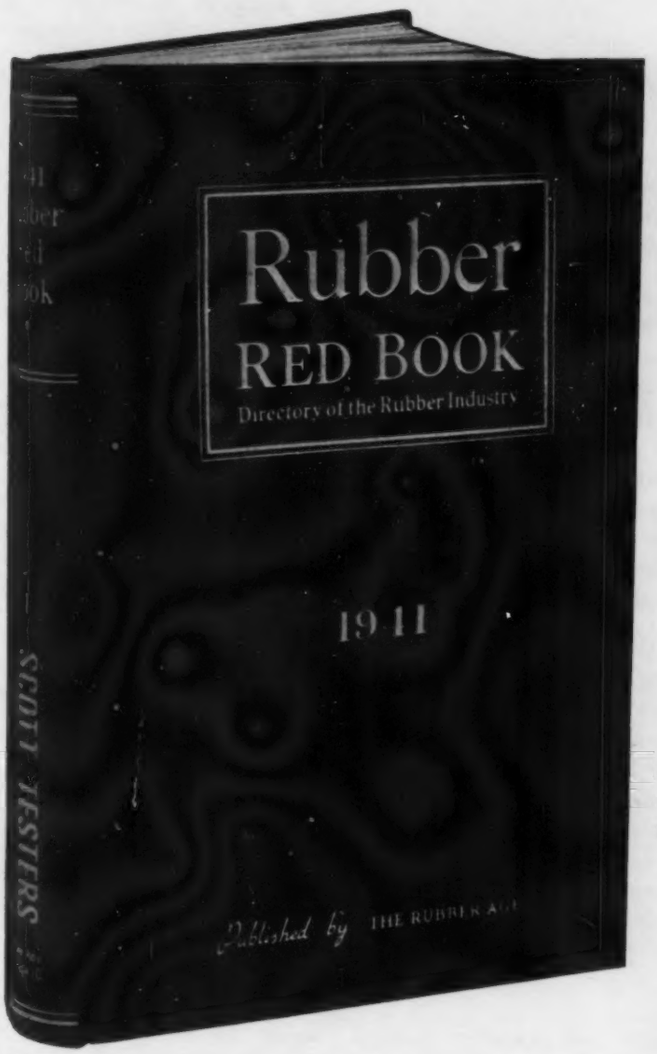
CRYSTEX (INSOLUBLE) SULPHUR

SULPHUR CHLORIDE — CAUSTIC SODA
CARBON BISULPHIDE — CARBON TETRACHLORIDE

STAUFFER CHEMICAL COMPANY

420 LEXINGTON AVE., NEW YORK, N. Y.
555 SO. FLOWER ST., LOS ANGELES, CAL.
FREEPORT, TEXAS
APOPKA, FLORIDA
624 CALIFORNIA ST., SAN FRANCISCO, CAL.
230 NO. MICH. AVE., CHICAGO, ILL.
424 OHIO BUILDING, AKRON, OHIO

Have You Got Your Copy Yet?



514 Pages
6 x 9 inches
Cloth Bound

Price
$5.00
Postpaid

The Enlarged 1941 Rubber Red Book

Completely revised with all data brought strictly up-to-date

Several new sections added based on the needs of the industry and at the suggestions of users

Fully indexed for easy reference, making the location of any material a simple matter

New cover of latex-bonded fibre with leather finish which will withstand constant handling

Contains information and data not available elsewhere (see Table of Contents on reverse side)

Send for your copy today
—Use coupon on reverse side

•

Published by

THE RUBBER AGE
250 West 57th Street
New York, N. Y.

The INDISPENSABLE REFERENCE BOOK for Rubber Manufacturers, Suppliers, etc....

To rubber factory executives, purchasing agents, technologists, etc., the RUBBER RED BOOK furnishes complete and handy lists of suppliers of all kinds of materials, equipment and services classified for easy reference. This is a service which saves buyers much time and effort as in no other directory are such lists available.

Suppliers and their salesmen, on the other hand, find the RUBBER RED BOOK invaluable for its complete and accurate listing of rubber manufacturers in the United States and Canada with such data as size of company, type of products made, names of buyers and other executives, etc. Also included is a geographical breakdown of rubber manufacturers in the United States showing all companies in each city and town. This feature enables salesmen to be certain that no prospect is overlooked.

No matter what position you hold in the rubber industry—factory executive, purchasing agent, chemist, technologist; supplier of machinery, chemicals, rubber, or other materials; librarian; consultant; salesman or user of rubber products—you should have a personal copy of the 1941 RUBBER RED BOOK on your desk or in your brief case ready to give an immediate answer to the thousand and one questions which crop up constantly, particularly during these critical days when accurate information is so essential.

Summary of Contents 1941 RUBBER RED BOOK

RUBBER MANUFACTURERS IN THE UNITED STATES
Alphabetical Section; Classified List of Rubber Products; Geographical Section.

RUBBER MANUFACTURERS IN CANADA

RUBBER MACHINERY AND EQUIPMENT
Classified List of Machinery; Machinery Manufacturers and Addresses

ACCESSORIES AND FITTINGS
Classified Lists of Products; Suppliers and Addresses

RUBBER CHEMICALS AND COMPOUNDING MATERIALS
Classified List of Materials; Trade and Brand Names; Suppliers and Addresses

FABRICS AND TEXTILES
Classified List of Materials; Suppliers and Addresses

CRUDE RUBBER AND RELATED MATERIALS
Classified List; Suppliers and Addresses

SYNTHETIC RUBBER AND OTHER RUBBER-LIKE MATERIALS

RECLAIMED RUBBER
Manufacturers and Addresses; Methods of Manufacture; Statistics (1919-1940)

SCRAP RUBBER DEALERS

RUBBER DERIVATIVES

RUBBER LATEX
Latex and Latex Compounds; Water Dispersions; Special Latex Processes; Latex Compounding Materials; Latex Machinery and Equipment

MISCELLANEOUS PRODUCTS AND SERVICES
Backing for Camelback; Cork Products, Wax Crayons; Decalcomania Transfers; Scrap Rubber Grinding; Inks for Printing on Rubber; Rubber Labels; Master Batches; Liner Compounds; Liners Processed; Processed Liners; Processed Paper

CONSULTING TECHNOLOGISTS

MANUFACTURER'S SALES AGENTS, BRANCH OFFICES, ETC.
In the United States; In Canada

TECHNICAL JOURNALS

TRADE AND TECHNICAL ORGANIZATIONS

WHO'S WHO IN THE RUBBER INDUSTRY

SUBJECT INDEX

USE ATTACHED CONVENIENT ORDER FORM

..... 19.....

THE RUBBER AGE
250 West 57th St., New York

Kindly send ..... copies of the 1941 RUBBER RED BOOK at $..... each to the undersigned:

Remittance Herewith ☐

Send Invoice ☐

NAME _____

ADDRESS _____

_____

_____

← MAIL THIS COUPON OR USE YOUR PURCHASE ORDER

PRICES (Postpaid)

1 to 4 copies..... $5.00 each
5 to 9 copies..... 4.50 each
10 or more..... 4.00 each

NOTE: If copies are to be sent to more than one address attach separate sheet to order form.

IDLE MILLS CAN'T FIGHT!

This is the time for action. America has always found a way. ***You cannot grow your own crude rubber, BUT—***

YOU CAN MAKE YOUR OWN RECLAIM IN YOUR PRESENT PLANT USING MOST OF YOUR PRESENT MACHINERY AND USING YOUR OWN RUBBER SCRAP PLUS OUTSIDE PURCHASES AT LOW COST WITH THE

NERVASTRAL RECLAIMING PROCESSES

Available to the manufacturer of rubber articles are these processes for reclaiming, using ordinary equipment, taking from one to three hours and producing these types of reclaim:

Write Today for Full Details

	A (High Grade)	B (Low Grade)
Tensile	1700-2000 lbs.	500-600 lbs.
Elongation	350-400%	260-300%
Specific Gravity	1.10-1.15	1.12-1.15

KEEP THOSE MILLS ROLLING!

RUBBER & PLASTICS COMPOUNDS COMPANY, Inc.

30 ROCKEFELLER PLAZA NEW YORK, N. Y.

CABLE ADDRESS: "RUBCOPLA" NEW YORK **TELEPHONE: COlumbus 5-0085**

LUBREX

UNIVERSAL MOLD LUBRICANT

Proves *Also* its Superiority for All-Reclaimed Compounds

Molds "break" readily and the product is easily removed when LUBREX is used. Even those tacky all-reclaimed compounds can't stick—and that is why more and more manufacturers are turning to LUBREX for speedier production without the need of loading compounds with dryers. LUBREX is a *Precision* product—dependable in its uniform efficiency as a mold lubricant for all types of compounds. LUBREX does not build up a film in the mold, does not affect rate of cure and gives a satin sheen to finished products . . . Test LUBREX for your own proof of its time-saving and labor-saving value . . . We will gladly send samples.

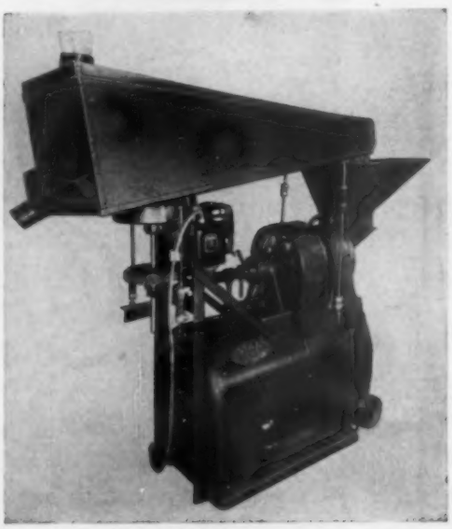
STANDARD
Chemical Company
AKRON SAVINGS AND LOAN BLDG. . AKRON, OHIO

HELP TO CONSERVE ESSENTIAL RUBBER

By Utilizing The

SPAN GRINDING MILL

for reducing all grades of vulcanized rubber scrap to fine powder form ready to be mixed with ordinary molding compounds.



Provided with an attached vibrating screen, the latest model SPAN GRINDING MILL (Type VIII) is a compact, self-contained unit producing a uniform material entirely automatically and at lowest cost of operation. Capacity 200 to 400 lbs. per hour. Power required, 25 H.P.

M. PANCORBO
155 JOHN STREET, NEW YORK, N. Y.

We Cover the Country!

for

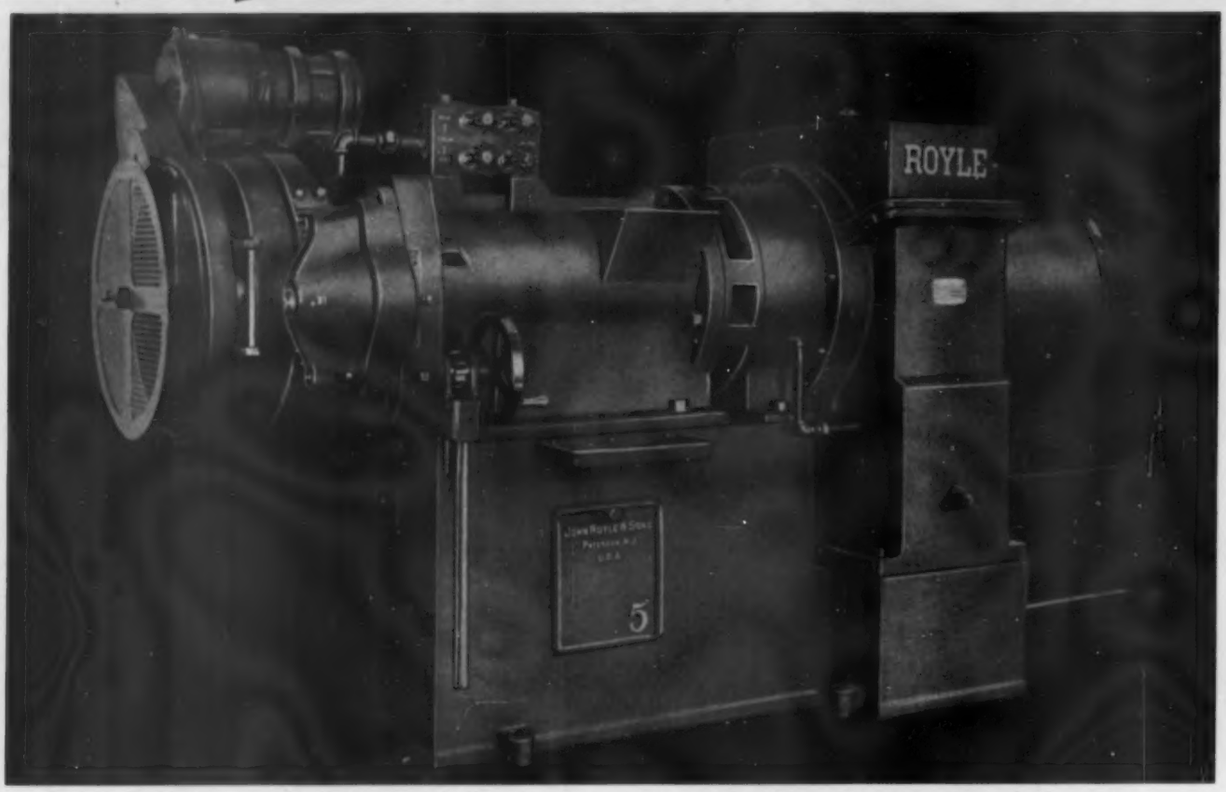
Scrap RUBBER

H. MUEHLSTEIN
& COMPANY, INCORPORATED

122 EAST 42nd STREET NEW YORK, N. Y.

BRANCHES

Chicago Los Angeles Boston Akron Memphis



A PRODUCING STRAINER! THE ROYLE 8½" WITH MANUALLY-OPERATED BREECH LOCK HEAD

In factories throughout the country, chimneys belch black smoke and giant machines roar as raw materials are converted into goods that make America strong.

★ — **BUSINESS IS GOOD** because industry is bustling to produce the goods and machines required to build guns, planes and ships, vital to national defense.

John Royle & Sons is typical of America today as she strains to meet the quickening demand. Our business is good because of the increasing demand for the kind of quality and service we give. To the limit of our facilities, top service is always at your call.

John Royle & Sons *Since 1855*

ROYLE PATERSON N J

AKRON, J. C. CLINEFELTER • • LONDON, JAMES DAY (MACHINERY) LTD.

ROYLE'S 62ND. YEAR OF EXTRUDING MACHINE MANUFACTURE

1815 . . . Jackson at New Orleans

The fate of our national government hung in the balance at the close of 1814. The shock of a severe defeat at New Orleans might have sent the fragments of a discredited government flying from the capital. But General Andrew Jackson and his Kentucky and Tennessee riflemen mowed down a veteran force under Pakenham and won a victory that gave the country new confidence.

ANDY Jackson's men had two priceless qualities: courage, and uncanny accuracy with their long rifles. Pioneer life had processed them for battle.

There are priceless qualities of background to be found, too, in the materials of industry . . . qualities that can only be built into them by skill and integrity.

Such materials of industry are Atlantic Carbon Blacks, precisely and honestly manufactured to meet the exacting standards of modern production.

ATLANTIC CARBON BLACK

MANUFACTURED BY

CHARLES ENEU Johnson AND COMPANY

DISTRIBUTED BY

The C. P. Hall *Co.*

AKRON • BOSTON • LOS ANGELES • CHICAGO

This set of No. 11 rotors finished and on our loading platform in record time . . . Note how rotor contours have been built up to correct shape to provide maximum mixing speed and efficiency.

. . . his spring song is the Hum of Production ---

Keep Your Banburys in Tune!

★

If you have spare or worn Banbury parts write us at once . . . We will pay cash for them . . . Remember, too, you will be serving a patriotic cause by helping maintain some other Banbury on the production line.

★

Your Banburys can either be in harmony or in discord to the rising cresendo of production . . . It is important now that they be "tuned" to meet the tempo of need . . . We know how to do that "tuning" with expert skill . . . We have specialized in the rebuilding, hard-surfacing and repairing of Banburys for years. From this experience has come scientific developments in hard-surfacing rotors and mixing chambers—developments that provide the wearing parts with an "armor" that meets the wear and tear of fast, hard mixing for a longer period of efficient service . . . We can help you get the *maximum* output from your Banburys. Write, wire or phone us today.

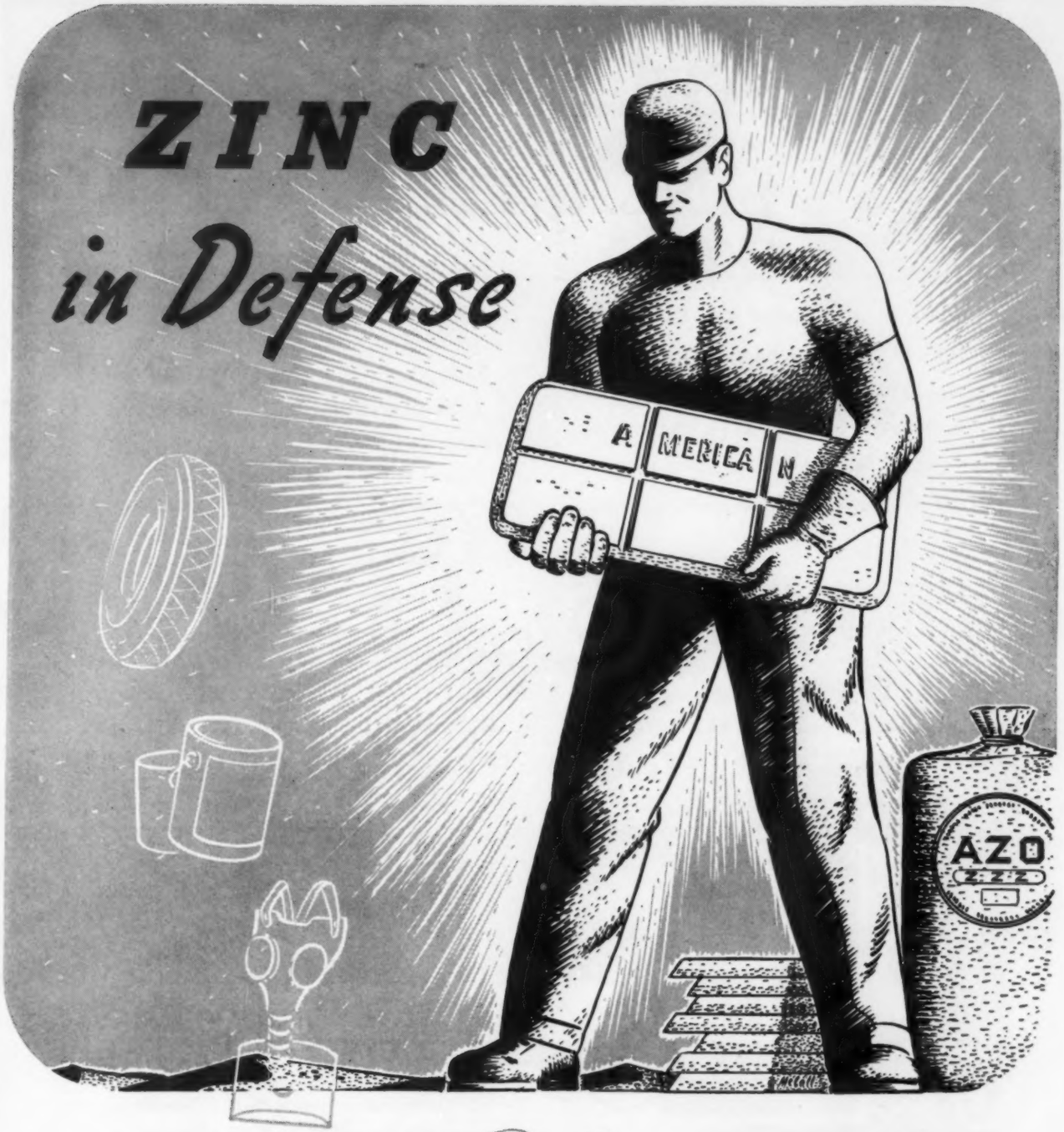
SERVING THE RUBBER INDUSTRY

914 Miami Street *Akron, Ohio* *Phone JE 7970*

INTERSTATE WELDING SERVICE

Main Plant AKRON, OHIO

EXCLUSIVE SPECIALISTS IN BANBURY MIXER REBUILDING



In a thousand ways zinc is vital to the nation's defense program. The brass for shells is one-third zinc. Alloyed with aluminum, zinc helps build airplanes. The zinc which covers galvanized metal equipment protects it from rust and corrosion. In sheet form zinc makes batteries and boiler plates. Zinc oxides are vital in the manufacture of rubber tires, gas masks, paint products, and many other defense items.

Though defense comes first, the American Zinc industry is employing every available facility in an "all out" effort to satisfy the unprecedented demand for every zinc product.

AZO
ZINC OXIDES

AMERICAN ZINC SALES CO.
Distributors for
American Zinc, Lead & Smelting Co.
Columbus, O., Chicago, St. Louis, New York

CAPITOL PROCESS
LINER TREATMENT

The Capitol Process of Liner Treatment is an economical and efficient method of rendering cotton piece goods repellent to adhesion of rubber stocks. It fills a distinct need for a low cost treatment of fabrics to give them non-sticking properties and long life.

Should your stocks require no specially treated liners to prevent adhesion, our processing of the fabrics you now use will lengthen the duration of their usefulness many times over and create an important reduction in your annual purchases of cotton piece goods for this purpose.

Try the CAPITOL PROCESS on your next order of Rubber Repellent Liners.

TEXTILE PROOFERS, Inc.
One Gates Ave., Jersey City, N. J.

STANDARDIZED QUALITY

LATEX

· NORMAL · CONCENTRATED · PROCESSED

Consistent Standardized Uniformity

Concentrates from 50% to 75% solids content for all industrial uses.

Specially processed latex and compounds to meet new and old requirements.

We offer many processed types and formulas suitable for particular applications, and also supply to buyers' own specifications.

Trade Mark

HEVEATEX
CORPORATION

78 GOODYEAR AVE. MELROSE, MASS.

Trade Mark

NEW YORK, N. Y. CHICAGO ILL. AKRON, OHIO. LOS ANGELES, CAL.

CONTINENTAL WEATHER CONTROL helps you produce

BETTER RUBBER

Do you know that a windstorm or a spell of sultry weather *two months ago* can affect the quality of your rubber production *today?*

This is true because in the channel process of producing carbon black an even flow of air in the burner houses is necessary to assure a uniform product. Shifts in wind velocity or direction, changes in temperature, rain, sleet, or snow storms upset this even flow, causing variations in the quality of the black. These variations are often reflected in the quality of the rubber in which it is used.

This, however, is *not* true of Continental Blacks—for Continental has developed a method* that offsets the weather as a variable factor. This *new* method, called ISOTHERMAL CONTROL, assures an even flow of air and a correct balance of temperature and humidity within the burner houses—regardless of what the weather conditions are outside. All 366 of Continental's burner houses are operated under ISOTHERMAL CONTROL. This means a better, more uniform black for you—and greater assurance of obtaining uniform rubber products. Test after test have proved its superiority.

Continental is pioneering constantly along such lines to help you obtain better results in your formulating processes. This development is of even greater importance than the introduction of Continental's special system of grading, which has simplified the selection and use of blacks for many users. Use CONTINENTAL ISOTHERMAL CONTROLLED BLACKS and benefit by their higher quality and uniformity.

* Patent Applied For

TESTED AND PROVEN! To determine the effectiveness of this control under varying weather conditions, one unit in the Continental Plant was operated for 30 days with the control and 30 days without the control. Frequent samples of the product were taken each day and tested with the D. P. G. adsorption test. The following statistical results indicate the definite superiority of ISOTHERMAL CONTROL:

	With Control	Without Control
Average D. P. G. Adsorption..	48.54	48.35
Maximum + Deviation...	2.83	4.85
Maximum — Deviation...	3.79	7.25
Average Deviation.....	1.04	2.23

CONTINENTAL CARBON COMPANY

295 MADISON AVENUE, NEW YORK, N. Y.

Akron Sales Office: Peoples Bank Building
Akron, Ohio — Plant: Sunray, Texas

SALES REPRESENTATIVES

Ernest Jacoby & Co., Boston, Mass.
Marshall Dill, Los Angeles & San Francisco, Cal.

SAVE YOURSELF UNNECESSARY STEPS

Cyanamid's warehouses are situated at conveniently located shipping points—to save you time and unnecessary steps in obtaining chemicals for rubber production. Note the addresses of our sales representatives below. And depend on it, Cyanamid controlled quality means time and trouble saved for you in processing, too. Get in touch with our nearest office for—

***AERO BRAND ACRYLONITRILE... AERO BRAND DPG... AERO BRAND DOTG... AERO AC 50... AERO BRAND RUBBER SULPHUR ...K & M MAGNESIUM OXIDE... K & M MAGNESIUM CARBONATE**

**Reg. U. S. Patent Office*

Sales Representatives to the Rubber Industry and stock points: Ernest Jacoby & Company, Boston, Mass.; H. M. Royal, Inc., Trenton, N. J., and Los Angeles, Cal.; Herron & Meyer, Chicago, Ill.; Akron Chemical Company, Akron, Ohio.

AMERICAN CYANAMID
& CHEMICAL CORPORATION

A Unit of American Cyanamid Company

30 ROCKEFELLER PLAZA · NEW YORK, N. Y.

Rubber's Prime Substitute — Reclaim

New Synthetic Rubber Plants are in the blue print stage right now and will take at least a year before their additional production added to what is produced now can take up the shortage of tree grown rubber.

The Reclaiming Industry working on the scrap pile now in this country is working to capacity to help our Government's Defense Program.

PEQUANOC RUBBER CO.

QUALITY RECLAIMS FOR SPECIFIC PURPOSES

BUTLER NEW JERSEY

SALES REPRESENTATIVES

Robert Knoblock
2301 Lincoln Way West
Mishawaka, Indiana

Harold P. Fuller
31 St. James Avenue
Boston, Mass.

E. B. Ross
No. 1 Toronto Street
Toronto, Ontario, Canada

Burnett & Co. (London) Ltd.
189 Regent Street
London W. 1, England

9 TONS EQUALED 10

SUN RUBBER PROCESSING OIL
saved more than 10% of crude stock

Every pound of rubber *must* be conserved now . . . and conservation can start with you as the compounder!

In rubber manufacturing plants throughout the nation SUN Circo Light Processing Oil is making possible a saving of tons and tons of crude rubber. On regular production runs leading compounders have saved more than 10% of their crude rubber stocks —in experiments they have proved savings as high as 20%.

Start today! In your own plant, under your own operating conditions prove SUN Circo Light Processing Oil makes it possible to:

- **produce more goods from crude rubber on hand.**
- **use larger percentages of inert material**
- **maintain quality and desired physical characteristics**
- **reduce cost of compounding**
- **make processing easier**

Check with a Sun "Doctor of Industry" today on the practicability of revising your formula to stretch rubber stocks and speed-up production. Write

SUN OIL COMPANY • PHILADELPHIA

Sponsors of the Sunoco News Voice of the Air—Lowell Thomas

LET'S GO! U.S.A. KEEP 'EM FLYING!

SUNOCO

SUN PETROLEUM PRODUCTS HELPING INDUSTRY HELP AMERICA

The RUBBER AGE

One of the World's Outstanding Rubber Journals

M. E. LERNER
Editor

M. CLIFFORD
Production Manager

R. E. GAINES
Circulation Manager

PETER P. PINTO
General Manager

VOLUME 50
NUMBER 6

CONTENTS FOR MARCH, 1942

The Effect of Temperature on the Sunlight Deterioration of a Rubber Compound—*By J. M. Ball and C. E. Bradley, Jr.* 425

An Eye-Witness Account of the Attack on Pearl Harbor .. 430

Colloidal Carbon as Revealed by the Electron Microscope—*By William B. Wiegand and William A. Ladd* 431

Glycerized Liquid Lubricant 436

Supplementary Order No. M-15-b-1 437

Regulations on the Sale and Purchase of Crude Rubber, Normal or Concentrated Latex, Deproteinized Rubber, and Sprayed Rubber 442

Amendment No. 5 to Supplementary Order No. M-15-b ... 445

REGULAR DEPARTMENTS

New Equipment Section ..	466	Obituaries	465
Book Reviews	470	Los Angeles News	463
Editorial	447	Rubber, Cotton Markets ...	477
Late Domestic News	448	Chemical Markets	478
Financial News	462	Statistics	479
Names in the News	460	Market Place	483
Coming Events	458	Classified Ads	475

Published on the 15th of each month by

PALMERTON PUBLISHING COMPANY, INC.

Printing office,
East Stroudsburg, Pa.

Editorial and Advertising Offices,
250 West 57th St., New York City

New England Representative—F. ROYAL CAREY, P.O. Box 133, Providence, R. I.
Western Representative—IRVING V. KOCH, 64 East Lake St., Chicago, Ill.

Entered as Second Class Matter, October 20, 1933 at the Post Office at East Stroudsburg, Pa., under Act of March 3, 1879. Subscription Rates: Domestic, $3.00 a year; Canada, $3.50; Foreign, $4.00. Single copies up to 3 months old, 35 cents; over 3 months old, 50 cents. Telephone COlumbus 5-2923, 5-2924.

Contents Copyrighted 1942 by the Palmerton Publishing Company, Inc.

Indexed in Industrial Arts Index. OFFICERS: P. L. Palmerton, President; E. D. Osborn, Vice-President and Secretary; Peter P. Pinto, Treasurer.

Also Publishers of:

RUBBER RED BOOK
Directory of the Rubber Industry
Published Biennially

ANNUAL BIBLIOGRAPHIES OF RUBBER LITERATURE
Compiled by D. E. Cable, Ph.D.
First issue covers year 1935

LATEX IN INDUSTRY
By Royce J. Noble, Ph.D.
Text Book on Latex

LATEX AND ITS INDUSTRIAL APPLICATIONS (Vol. I)
By Frederick Marchionna
Bibliography of latex patents and literature to June, 1932.

LATEX AND RUBBER DERIVATIVES AND THEIR INDUSTRIAL APPLICATIONS (Vols. II & III)
By Frederick Marchionna
Bibliography of latex patents and literature from June, 1932 to January, 1937; rubber derivatives to January, 1937.

TONOX

A Big Help in Conserving Rubber

In the present emergency it is more important than ever to get the maximum quality in your products from the materials available.

Tonox is an effective chemical for improving the quality of many rubber products.

Here are some results now being obtained by using Tonox:

- In Tire Treads: Better abrasion resistance, less cracking, lower heat build-up.
- In Tire Carcasses with high reclaim: Better flexing, better properties when hot, better aging.
- In Wire Insulation: Better processing, stiffening uncured stocks to prevent flattening.
- In Footwear: Inhibits frosting and cracking.

Naugatuck Chemical

DIVISION OF UNITED STATES RUBBER COMPANY

ROCKEFELLER CENTER NEW YORK, N. Y.

The **RUBBER AGE**

VOL. 50. No. 6 **MARCH. 1942**

The Effect of Temperature on the Sunlight Deterioration of a Rubber Compound

By J. M. BALL and C. E. BRADLEY, Jr.

R. T. Vanderbilt Laboratory,
East Norwalk, Connecticut

THE subject of this article might be stated, "Does temperature have an effect on the deterioration of rubber in sunlight, and if so approximately how much effect?" We are interested in any effect of temperature because rubber goods in service are frequently subjected to sunlight over a fairly wide temperature range. There are apparently very few references or comments in the literature on this subject; but we want to look briefly at some significant experiments of the past having to do with sunlight without regard for temperature, and then get on to the discussion of a new experiment.

Experiments of the Past

In 1885 William Thomson, the famous British scientist, gave an address before the Society of Chemical Industry entitled "India Rubber and its Decay" *(1)*. In that address he described an experiment in which he had stretched rubber threads and sealed them in tubes containing respectively air, oxygen, carbon dioxide and hydrogen. Also one set of tubes was evacuated. All tubes were exposed to direct sunlight each day for several months. After a few days exposure the threads in oxygen broke; and at the end of the exposure period the threads in air were rotten. The threads in the other tubes were sound at the end of the period.

In 1903 Dr. C. O. Weber, the well known rubber technologist, and author of *The Chemistry of India Rubber*, published a paper entitled "On the Action of Light on India Rubber" *(2)*. He described experiments wherein both cured and uncured Para, worked and overworked, were exposed to sunlight up to fifty days. The acetone extract increased during this exposure period in an amount depending upon the degree of overworking and also upon the amount of combined sulfur.

In 1926 Ira Williams published a paper entitled "Oxidation of Rubber Exposed to Light" *(3)* in which he stated that the oxidation of rubber is speeded greatly by the presence of ordinary light especially when the rubber is in a strained condition. He placed buffings from a pure gum inner tube in two glass bulbs containing oxygen, one covered with tin foil and the other exposed to July sunlight. In the exposed tube the rate of oxygen absorption was seven times greater than in the unexposed tube. Williams also put

Note: This article is based on a paper prepared by the authors and delivered by Mr. Ball at the October 16, 1941, meeting of the Ontario Rubber Section of the Canadian Chemical Association.

(1) *J. Soc. Chem. Ind.*, **4**, 710 (1885).
(2) *I.R.J.*, **25**, 639 (1903).
(3) *Ind. Eng. Chem.*, **18**, 367 (1926).

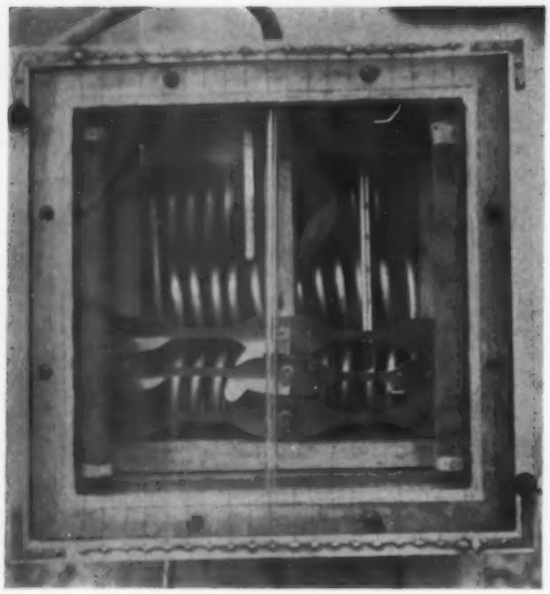


Figure 1

strips of a gray sidewall stock stretched five per cent in sealed glass tubes: one containing air, one containing oxygen and one having been evacuated. These tubes were exposed to July sunlight continuously each day for two weeks. The surface of the strips in air and in oxygen became slightly wrinkled, whereas the strip in the evacuated tube appeared unchanged.

In 1930 Mr. J. C. Howard and Mr. H. C. Boehmer, of the Kaufman Rubber Co., Kitchener, Ontario, bent samples of ordinary black footwear upper approximately 1/16-inch thick around a mandrel ⅜-inch in diameter, and placed them inside a clear quartz tube about 6 inches long and 1¼ inches in diameter. Samples were exposed during the summer under the following conditions:

1. Tube open and filled with air at atmospheric pressure.
2. Tube closed and filled with hydrogen at atmospheric pressure.
3. Tube evacuated.

The results were that the usual atmospheric cracking occurred in the tube containing air, but no cracking was observed under the other two conditions. The conclusions were that the cracking was caused by ozone formed by the action of sunlight on oxygen at the surface of the rubber.

The Present Experiment

We learn from these experiments that there is a necessary connection between oxygen and sunlight deterioration. The experiments, of course, were not intended to study the possible effect of temperature upon such deterioration. We felt that the effect of temperature might be interesting, and accordingly the Vanderbilt Laboratory undertook this little piece of work. The study was made at four temperatures, *viz.*, —30°C., +20°C., 70°C. and 100°C. for two different periods of exposure, *viz.*, 4 and 7 hours.

It was desired to use a good tire tread compound but such a compound does not deteriorate fast enough in sunlight to be suitable for an experiment which is likely to run up a big bill for dry ice. Consequently, the following compound was used, the cure being just about sufficient to prevent bloom:

TEST COMPOUND

Smoked Sheet	100.
Zinc Oxide	5.
Gilder's Whiting	60.
Sulfur	4.
D.P.G.	1.25
	170.25

Laboratory Press Cure:—20 Minutes at 307°F

Apparatus

Dumb-bell test specimens about 0.020 inches thick both unstretched and stretched 10 per cent were exposed to sunlight under Vitaglass in wooden boxes about 10 inches square, coated on the outside with aluminum paint, and insulated on the inside with Celotex. The bottom of the boxes contained the heating or cooling coils, and the samples were stretched or rested upon a wooden frame placed near the top of the box. Three thermometers were used in each box, one placed under the samples and two over the samples. One of those placed over the samples had been dipped several times into a self-curing cement of the stock until a total thickness of stock corresponding to the thickness of the dumb-bells was obtained around the bulb. The thermometer bulb covered with that stock was then placed in an oven at 70°C. for 1 hour at the end of which time thorough vulcanization had occurred. The two lowest temperatures, *viz.*, —30°C. and +20°C., were obtained with cooling coils; and the two highest temperatures, *viz.*, 70°C. and 100°C., were obtained with heating coils.

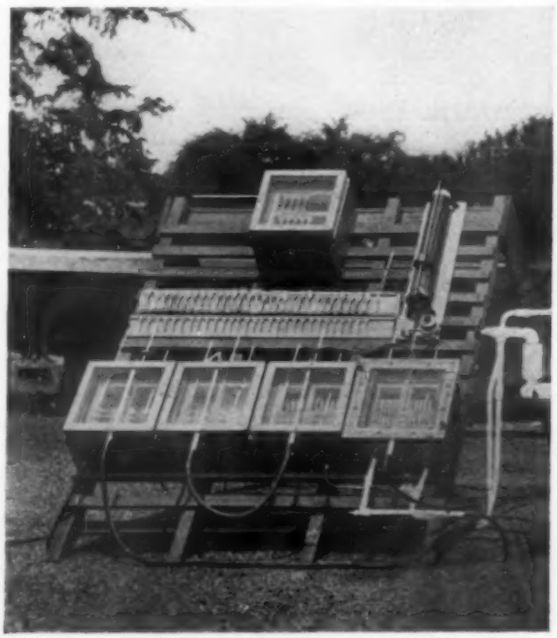


Figure 2

A small, wooden propeller revolved continuously in each box on a vertical shaft extending through the bottom of the box. The cooling coils contained circulating acetone supplied from a separate tank enclosing larger coils imbedded in dry ice. A storm window enclosed on both top and bottom by Vitaglass and Corex D glass, respectively, was screwed to the top of each box thus providing a cover as well as an insulating air space about one inch thick to prevent the frosting which would otherwise have occurred on the coldest box. Thus, the sunlight had to pass through two layers of glass, each about 1/16-inch thick. Also on the top of the coldest box 40 gauge Nichrome heating wires about ½-inch apart were placed in contact with the Vitaglass, and were kept hot to make doubly sure there would be no frosting. Both the boxes and the storm windows contained wire gauze tubes of calcium chloride sufficient to prevent condensation. Furthermore, through each storm window a single glass tube containing cold circulating acetone was inserted to condense upon it the last objectionable trace of moisture. Figure 1 is a photograph of the —30°C. box showing the cooling coil, the propeller, the samples, thermometers and storm window.

The boxes were mounted on a large wooden rack kept approximately perpendicular to the sun's rays throughout the exposure period. Duplicate sets of stretched and unstretched dumb-bells were mounted on uncovered boards placed on the rack beside the boxes. Figure 2 is a photograph of all the boxes and uncovered samples as assembled on the roof of the Vanderbilt Laboratory at East Norwalk, Connecticut.

To appreciate the reason for the choice of Vitaglass as a cover for the exposure boxes look at Figure 3, which is a diagram of the familiar solar spectrum. Note the visible range of wavelengths from about 4,000 to about 8,000 Å, as well as the indicated invisible ranges of the infrared and ultraviolet. An Ångström unit is 1 ten millionth of a millimeter and is used in expressing the wavelength of light or other short radiation.

Figure 4 illustrates the transparency of Vitaglass to the sun's ultraviolet radiation. It shows that this glass transmits a large proportion of the ultraviolet, *i.e.*, about 20 per cent at 2,900 Å. and about 85 per cent at 4,000 Å. It was desired to use Corex D glass, which we understand is even more transparent to the ultraviolet, but we were unable to obtain a sufficient amount in time. Ordinary window glass cuts off a much larger part of the ultraviolet radiation of sunlight than does Vitaglass. All we were trying to do was to let as much sunlight as possible through to the rubber.

TABLE OF TENSILE PROPERTIES

Stress at 300% (S)—Tensile (T)—% Elongation (E)

	First Period 4 Hours			*Second Period 7 Hours*		
	Darkness Controls					
	S	T	E	S	T	E
—30°C. Unstretched	585	2630	560	585	2650	560
—30°C. Stretched	585	2600	555	585	2640	555
+20°C. Unstretched*	590	2650	560	590	2650	560
+20°C. Stretched	585	2580	555	590	2500	560
+45°C. Unstretched	590	2700	555	610	2780	550
+45°C. Stretched	585	2650	555	605	2770	555
+70°C. Unstretched	675	2810	550	700	2730	550
+70°C. Stretched	675	2780	560	640	2560	540
+100°C. Unstretched	745	2060	500	730	1870	475
+100°C. Stretched	680	1965	500	695	1860	480
	Exposed Samples					
—30°C. Unstretched	670	2220	520	690	2200	530
—30°C. Stretched	650	2140	520	660	2220	530
+20°C. Unstretched	640	1740	490	685	1345	445
+20°C. Stretched	650	1680	485	680	1310	465
+45°C. Unstretched†	645	1500	470	655	1255	420
+45°C. Stretched†	650	1600	475	660	1190	425
+70°C. Unstretched	600	1120	440	...	420	180
+70°C. Stretched	590	925	430	...	420	200
+100°C. Unstretched	620	845	390	...	390	204
+100°C. Stretched	540	830	420	...	390	240

* This control has the same properties as the original, unexposed control.

† Uncovered.

Note: Free sulfur apparently tended to decrease, and acetone extract to increase during exposure, but the time of exposure was not long enough to justify any definite statement regarding these determinations.

Temperature Measurements

Now for the measurement of temperature. The three thermometers in each box agreed among themselves within 5°C. with the exception of the room

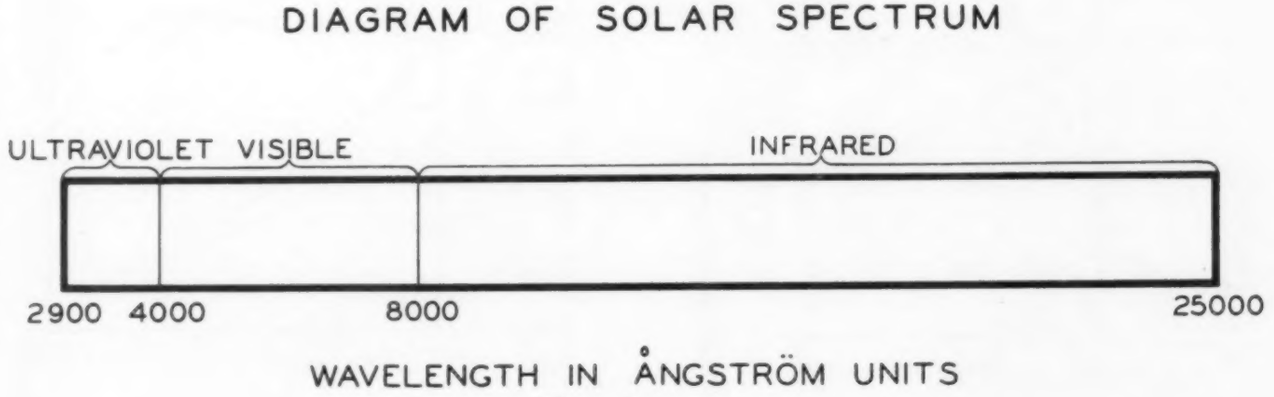


Figure 3

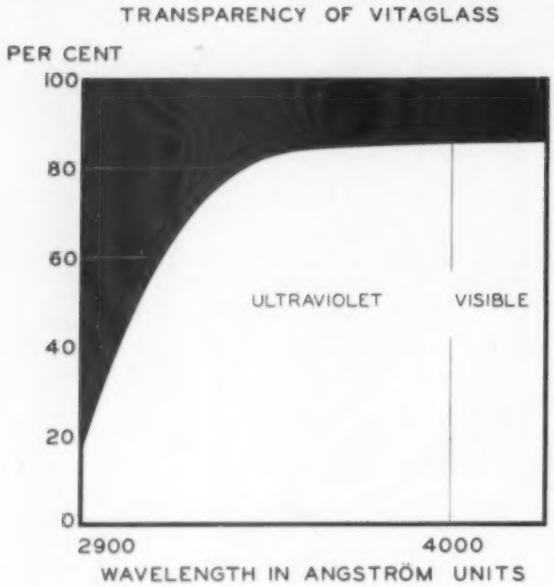


Figure 4

temperature box which showed somewhat wider variation. The three thermometers for the uncovered samples recorded about 45°C., agreeing among themselves within about 8°C. The two periods of exposure, namely 4 and 7 hours, occurred on August 6th, 1941, from about 9 A. M. to 4 P. M. Eastern Daylight Saving Time. There was continuous brilliant sunshine that day. A supply of control slabs was kept in a dark closet; and additional control samples were obtained by heating them in an oven at 45°C., 70°C. and at 100°C. for 4 and 7 hours; and also by cooling them in the dark to —30°C. for the same two periods.

Results

Let us see now what happened to the tensile strength of all the samples, stretched and unstretched, covered and uncovered, exposed and unexposed, at all the various temperatures. Let us begin with the lowest temperature, *i.e.*, —30°C.

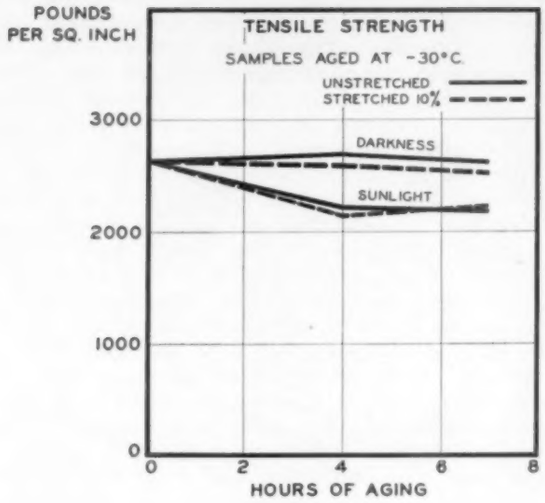


Figure 5

The accompanying graphs show tensile strength plotted against hours of aging. The tensile of the unstretched samples is represented by a solid line, and that of the stretched samples by a broken line. The two lines representing the exposed samples are marked "Sunlight," and the two lines representing the control samples are marked "Darkness."

Figure 5 is the graph for —30°C., and you will note that sunlight does have an effect even at this low temperature, as the tensile of the exposed samples drops in 7 hours from about 2,650 pounds per square inch to about 2,200 pounds. The stretched samples show about the same tensiles as the unstretched.

Figure 6 is the graph for +20°C. The deterioration due to sunlight is greater than at —30°C., but otherwise this graph looks much the same as the previous one.

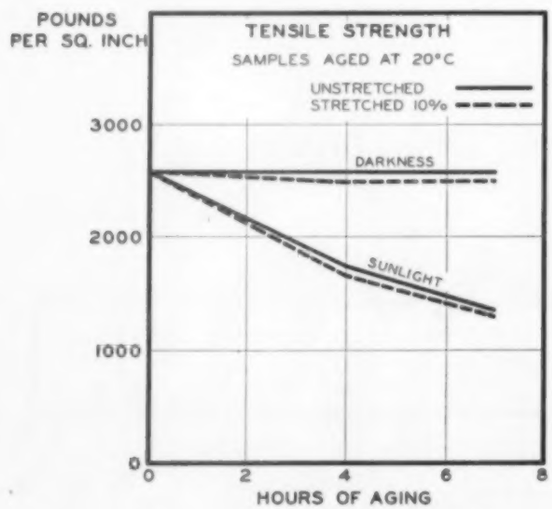


Figure 6

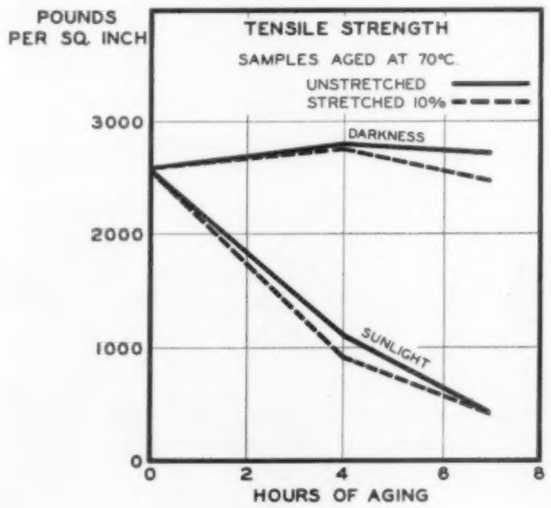


Figure 7

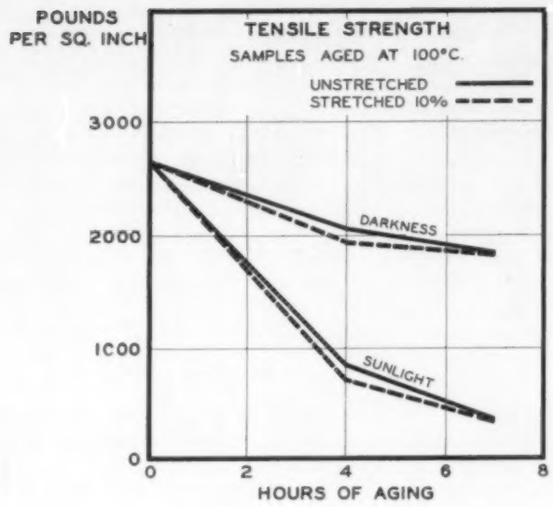


Figure 8

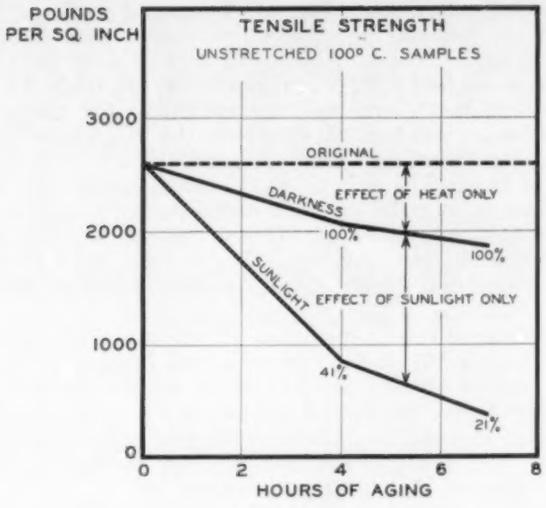


Figure 9

Figure 7 is the graph for 70°C., and is quite different from the first two. The "Darkness" control samples which were in the oven have actually increased in tensile, as is characteristic of some stocks, while the "Sunlight" samples have deteriorated badly. Here again, though, there is not much difference between the stretched and unstretched samples.

And lastly there is Figure 8, which is the graph for 100°C. For the first time the control samples, *i.e.*, those heated in the oven, have deteriorated in tensile. The exposed samples have lost more tensile than those at 70°C., but the spread between the control and the exposed samples is a little less at 100°C. than at 70°C. Note that the deterioration in sunlight is about three times as great as that in the oven.

Appearance of the Samples

A word about the appearance of the exposed samples. Sunlight exposure resulted in the formation of a surface skin on the exposed side of both stretched and unstretched samples at each temperature except at —30°C., but atmospheric cracking did not occur at any temperature. The surface skin was noticeable particularly because it cracked while the dumb-bells were being tested on the Scott machine. The under side of the samples did not show surface skinning, and exposure in the dark did not cause surface skinning at any temperature. Longer exposure periods in sunlight would undoubtedly have caused atmospheric cracking on the under side.

Summary of Tensile Results

Having secured and shown tensile results at the four temperatures on separate graphs (Figures 5, 6, 7, and 8) it seemed desirable to show all the temperatures together on one graph. Since we noticed very little difference between the stretched and unstretched samples, we confined our attention to the unstretched

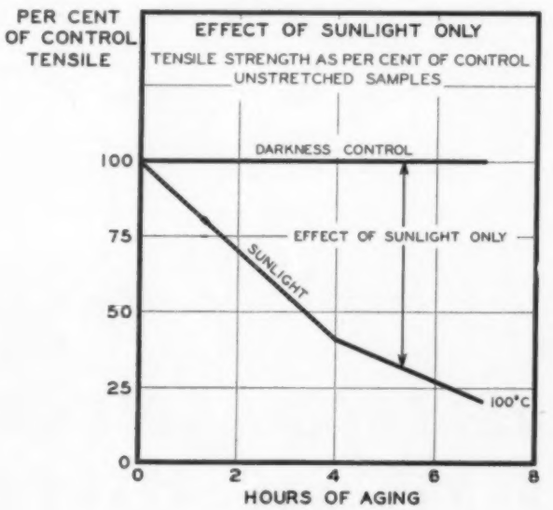


Figure 10

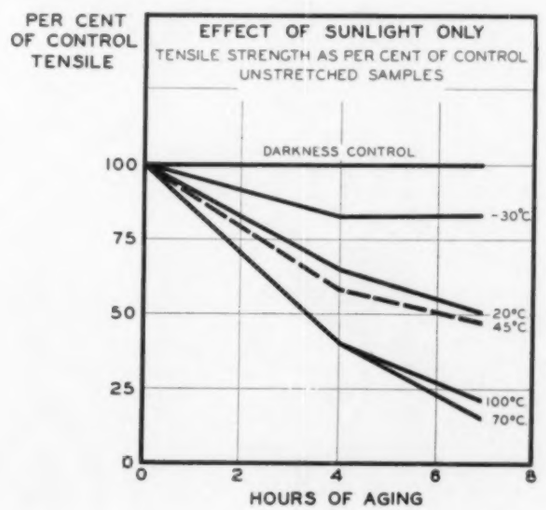


Figure 11

samples only in compiling this composite graph.

First, look at Figure 9 which shows again the results for 100°C., but plotted in a slightly different way. The space between the horizontal line for original tensile and the "Darkness" line represents the effect of heat only, and the space between the "Darkness" line and the "Sunlight" line represents the effect of sunlight only. The 4 hour and 7 hour tensiles for the darkness controls are both marked on this graph as 100 per cent, and those for the exposed samples are marked 41 per cent and 21 per cent, respectively, meaning that these are percentages of the control tensiles.

Figure 10 is a variation of the previous graph, showing effect of sunlight only, and plotting per cent of control tensile instead of actual tensile strength. In other words, the control samples are now represented by a horizontal line taken as 100 per cent throughout, and the "Sunlight" samples are represented as percentages of that horizontal control line.

This brings us to Figure 11, which contains all the various temperature lines. Included also are the results for the uncovered samples which are shown as a broken line. This broken line lies between the 20°C. and 70°C. lines. This graph, then, indicates that temperature does have a strong effect on the sunlight deterioration of the compound studied. The graph represents the net effect of sunlight after the purely heat effect or change in darkness has been subtracted from the total or over-all change. How important is this temperature effect? The last graph proves that at 20°C. the effect of sunlight only is two or three times that at —30°C., and that at 70°C. the effect is about 1.75 times that at 20°C.

ACKNOWLEDGEMENTS

In conclusion the authors wish to thank Dr. A. A. Somerville and Mr. E. B. Curtis for permission to use our laboratory, and Mr. W. H. Scott, Jr., who helped design and build the apparatus and who drew the graphs.

An Eye-Witness Account of the Attack on Pearl Harbor

CHARLES C. Gates, president of the Gates Rubber Co., of Denver, Colorado, maintains a winter residence in Honolulu. The family was in residence on December 7, 1941, when the treacherous Japanese attack occurred. Learning of Mr. Gates' whereabouts on that date, we asked him to give us an eye-witness account, which follows herewith by permission of the Office of Censorship, Washington, D. C.:

On December 3 my immediate family, including Mrs. Gates and our unmarried daughter Bernice, arrived in Honolulu from the Mainland where we maintain a winter residence situated on the side of Diamond Head directly facing Waikiki Beach and Pearl Harbor, the latter a distance of about eight miles.

For about a half hour preceding the beginning of the air attack on December 7 I was observing the peculiar movements of a destroyer and plane at the entrance of Pearl Harbor. The unusual activity of this ship and plane was later explained to have been an attack upon an enemy sub that was seeking to gain entrance to the harbor.

Just before eight o'clock in the morning the first shot of the war was plainly heard, this rapidly developing into a steady deep roar of earth-shaking intensity.

We have watched the development of the Island's land, sea and air defenses for a number of years, and, with most other residents of Honolulu, have believed the area was too well fortified to invite attack. Because of our convictions, for the first fifteen minutes of the bombing and gunfire we believed we were witnessing the most realistic practice maneuver we had ever experienced, although we had seen many during our residence in Honolulu.

When the anti-aircraft batteries got into full action the air was filled with exploding shells. Japanese bombers, plainly marked with the Rising Sun emblem, were coming in directly over our heads, sweeping low over the city on their way to their assigned objectives. Clouds of smoke were rising from Pearl Harbor. Fires were springing up in many parts of the city. It was then convincingly clear that we were experiencing our second contact with the real war. We were in Shanghai in 1932 during the Japanese bombardment and destruction of the Chinese quarters in that city.

The hit-and-run attack upon Pearl Harbor and air fields of Hawaii was over before thousands of Honolulu residents were aware of what was happening. The loss of life and property was appalling but before the smoke clouds had cleared away the real spirit of fighting America had organized itself.

Should the enemy ever return to the Islands there will be a different story to tell. However, it is probably a fact that only a treacherous blow such as fell upon Pearl Harbor could have awakened this nation to its grave danger.

We returned to the Mainland by Clipper just a month following the date of our arrival, not because we were apprehensive of the danger of continuing our residence there but because there were many problems pertaining to the rubber business that demanded close-up attention.

CHAS. C. GATES.

BUY

☆ UNITED STATES ☆

DEFENSE SAVINGS BONDS and STAMPS

Colloidal Carbon as Revealed by the Electron Microscope

By WILLIAM B. WIEGAND and WILLIAM A. LADD
Columbian Carbon Co., New York

THE electron microscope of today may be said to rest upon the pioneer work of three outstanding physicists. J. J. Thompson, in 1897, discovered electrons under the name of negative corpuscles. De Broglie, about 1922, established the wave characteristics of electrons. In 1926 Busch established the electron lens.

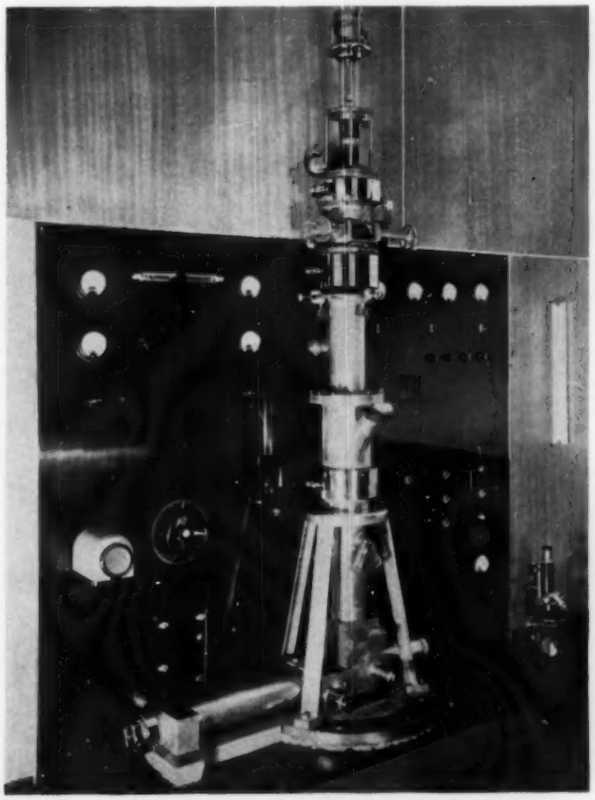
In 1935, E. F. Burton, following a visit to Germany, envisaged the enormous potentialities of the electron microscope and began a program at Toronto designed to eliminate the serious defects of early German instruments. In 1938, this program culminated in the construction of a new and superior instrument by two of his graduate students, A. Prebus and J. Hillier.

The publication of their results early in 1939 aroused the immediate interest of the Columbian Carbon Company which later established a Fellowship at Toronto under Professor Burton's direction. In 1940, A. Prebus, assisted by W. A. Ladd, working in Toronto, secured for Columbian the first perfect pictures of Micronex, from which accurate data as to mean surface area and as to particle shape were obtained. Public release followed in June, 1940.

Prebus is now Professor at Ohio State and is pursuing the theoretical side. Hillier is at R. C. A., where instruments, of essentially Toronto design, are being

NOTE: This article is condensed from a paper delivered by the authors at a meeting of the Buffalo Group, Rubber Division, A.C.S., held in Buffalo on February 27, 1942.

Professor Burton, A. Prebus and W. Ladd (left to right) photographing the Micronex particle at the University of Toronto in 1940.



Electron microscope in the Columbian laboratory.

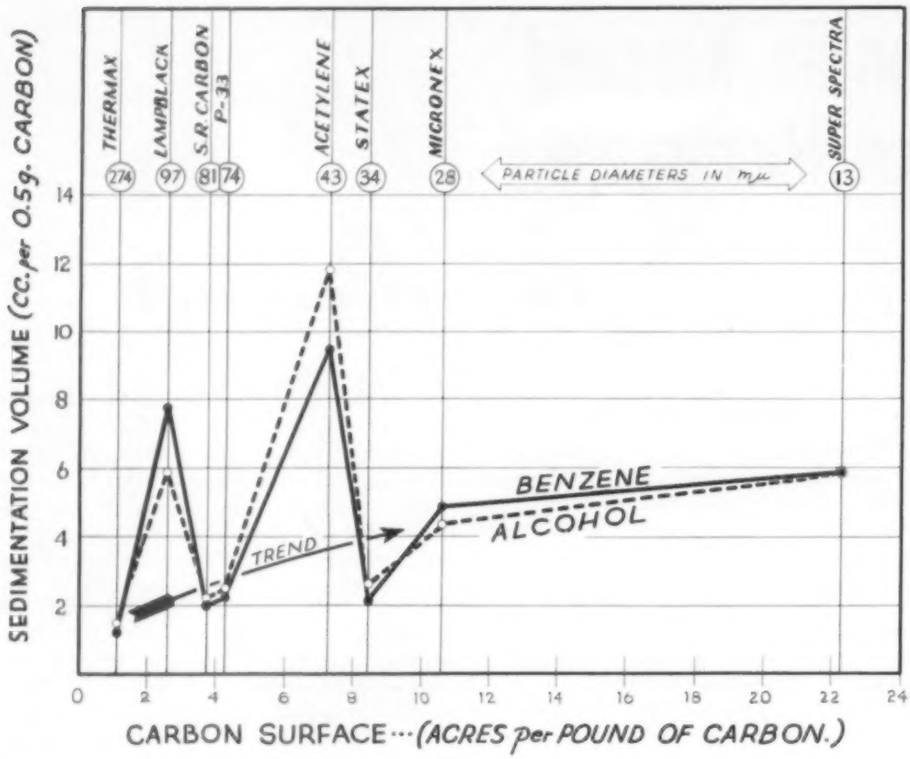
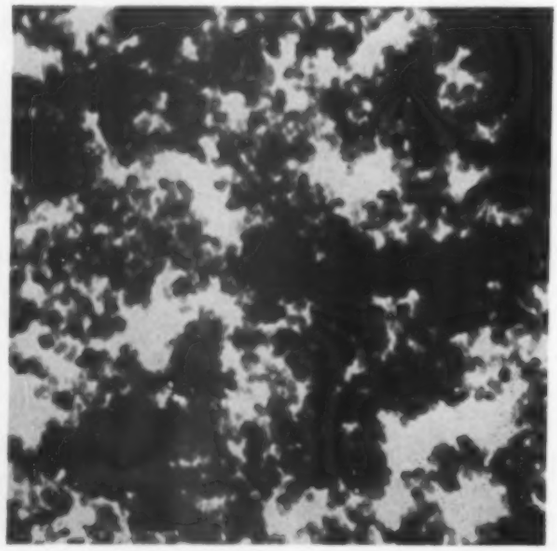


Fig. 1—Colloidal Behavior of Rubber Carbons.

developed commercially, and Ladd has joined the Columbian Carbon Research Laboratories, for the two-fold purpose of further improving the microscope and of applying it to the problems of natural and synthetic rubber reinforcement.

This work of Professor Burton and his pupils is of importance under present critical conditions since the replacement of natural by synthetic rubber necessitates a new approach to the theory and practice of rubber reinforcement. With the aid of the electron microscope, it is now for the first time possible to evaluate the role played by surface area in carbon-rubber reinforcement.



Micronex (32,400x)

The Electron Microscope

The elements of the electron microscope are directly analogous to the light microscope; a source of illumination, condensing lens, objective and projective lenses. Fundamental differences are: electrons replace light, magnetic coils replace glass lenses. The electrons are accelerated by a potential difference supplied by an 85,000 volt D.C. rectifier. Magnifications are measured by removing the pole piece in the projection lens, displacing the object by differential micrometer screws, and measuring the resulting displacement in successive photographs.

The object is supported by a collodion film 15-20 milli-microns thick. This film is in turn supported by a 200 mesh screen. At a magnification of 10,000 only one-four hundredth of one of these openings is viewed. Methods of mounting consist of dispersing carbon in nitro-cotton by the Coblac method *(1)*, atomizing on a prepared mesh screen or dispersing on a film by means of a high frequency electric discharge *(2)*.

The first photograph of carbon appeared in *Electronics*, November, 1938. This photograph taken with the first German instrument by Siemens, showed particles of carbon deposited by a candle flame, which were described as "small hexagonal scales."

In July, 1940, the Columbian Carbon Company, reported *(3)* the particle size of Micronex as 28 millimicrons and revealed the shape of these colloidal carbon particles as spheroidal. In addition, for the first time, distribution curves were used to obtain accurate

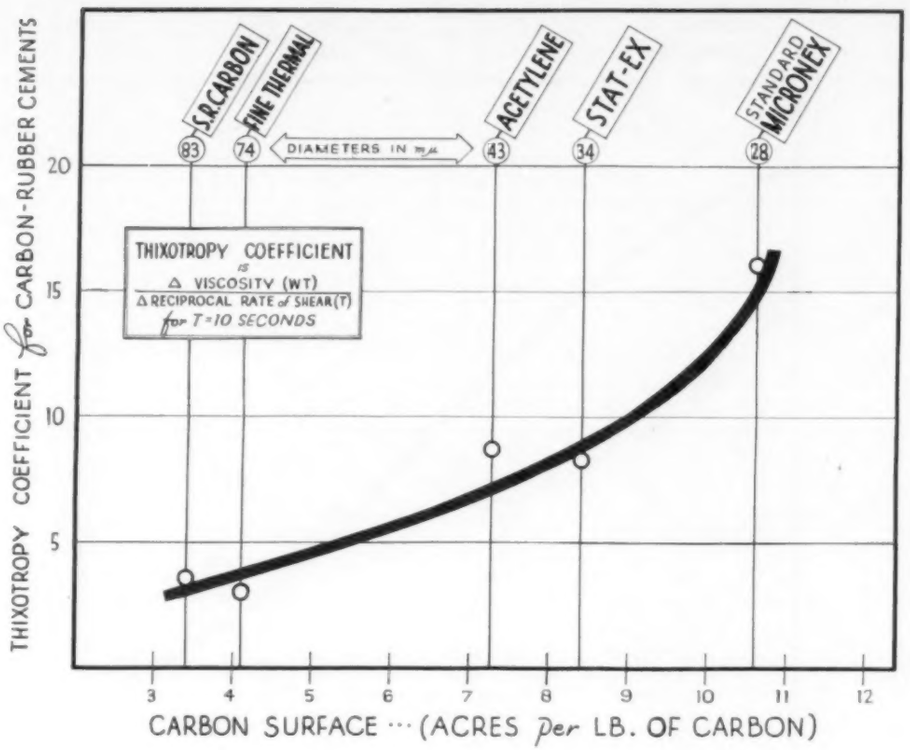


FIG. 2—Colloidal Behavior of Rubber Carbons.

mean particle diameters and surface areas of colloidal carbon.

As late as January, 1941 (*4*), the Germans still claimed hexagonal or circular platelet form for the carbon particles. Schoon & Koch based this claim on stereoscopic photographs of a few carbons. Later, however, in May, 1941, Heering, Gizycki & Kirseck (*5*) showed the form of Thermax and P-33 to be spheroidal thus fully substantiating the results of the Columbian Carbon Company's previous work in 1940.

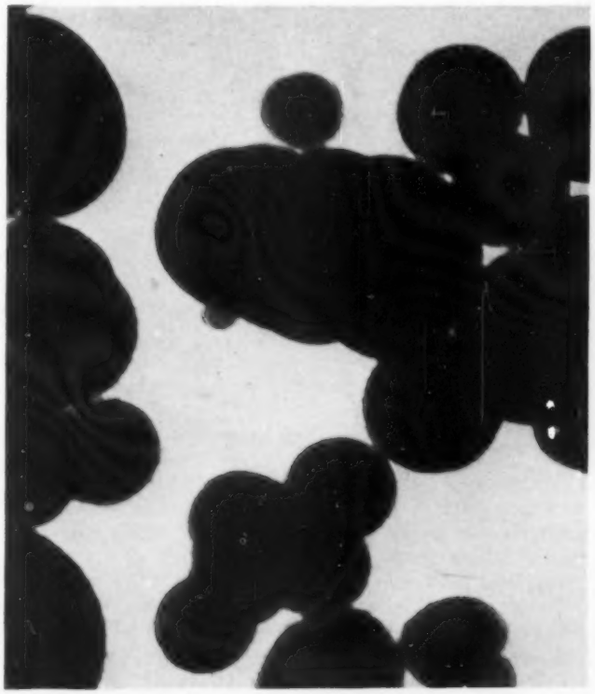
Measurements of particle size are most conveniently made on a print enlarged to 50,000 diameters. Only particles that are discrete or reveal a full diameter are measured. From these values distribution curves are plotted. These give the number of particles (expressed as a frequency percentage) for each particle diameter range. Skewness in these curves is due either to inability to discern the very small particles (Super Spectra) or to a wide and unsymmetrical range of particle sizes (lamp black).

The distribution curves provide the only means for determining the true mean diameter of carbon particles and hence accurate surface areas. The correct method for obtaining accurate surface values would be to sum up the areas of the individual particles. Assuming a symmetrical distribution curve, however, a very close approximation to the correct value can be readily calculated. Errors by other methods are also discussed in the original Columbian publication (*3*).

The Role of Surface in Reinforcement

This subject has been discussed in a recent communication *(6)*. The preliminary conclusions may be summarized as follows:

(a) Energy of rupture (resembling tinting strength) is dominated by surface area up to 8 acres thereafter tending to flatten out.
(b) Tensile strength (like color) shows continued upward trend with surface area.



Thermax (50,000x)

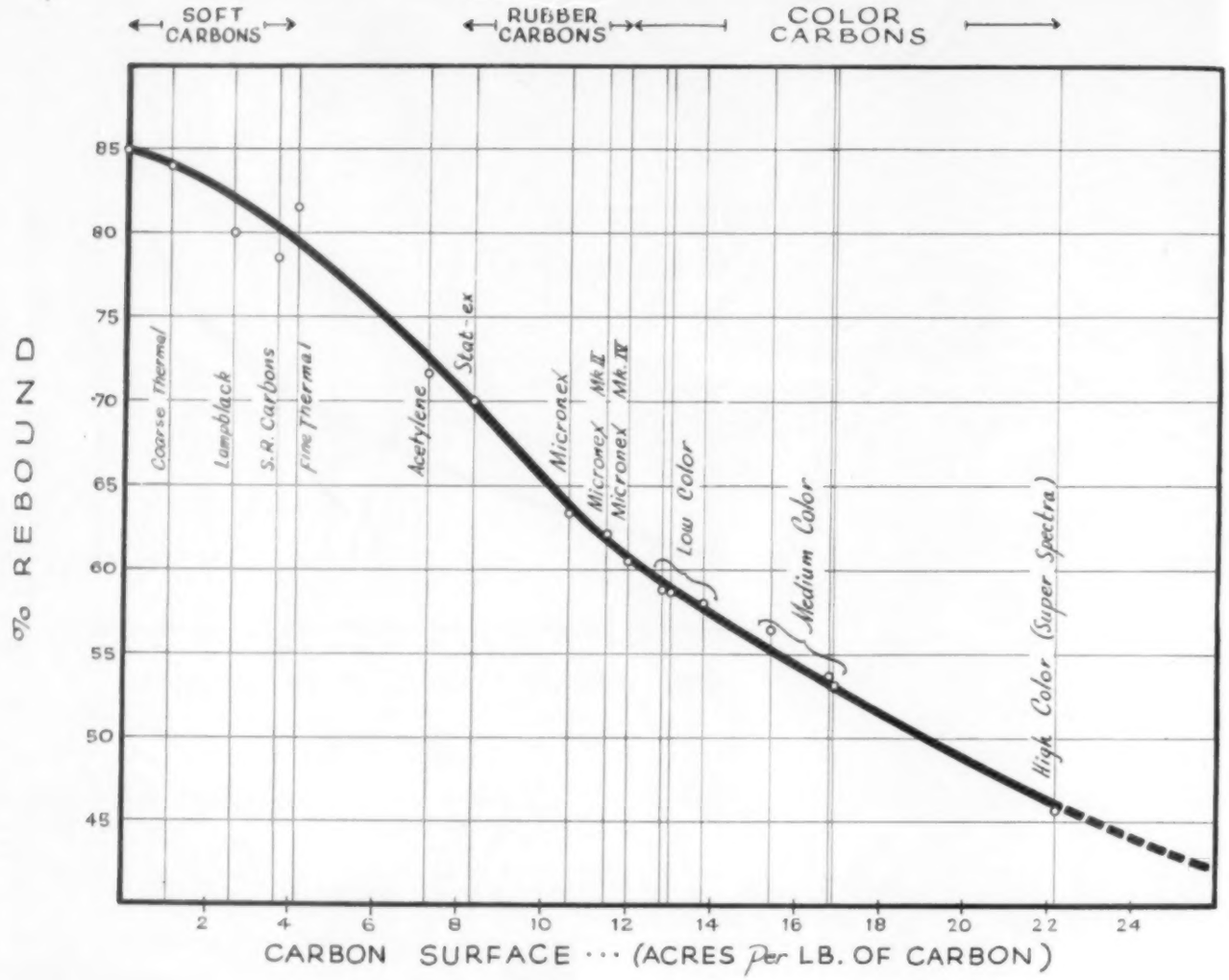


FIG. 3—Rebound Resilience and Carbon Surface.

(c) Modulus (at 300%) presents little discernible response to increasing surface.
(d) Shore hardness displays a generally upward trend with increasing carbon surface, and raw plasticity a corresponding downward trend.
(e) Electrical conductance shows no consistent trend with advancing surface area.
(f) Rebound resilience alone appears to correlate consistently downward with increasing surface.

Anomalies and the Need for a New Theoretical Approach

Acetylene black and lamp black are lower than expected in energy of rupture, tensile strength, tinctorial strength, plasticity and density, and higher than expected in modulus, hardness, electrical conductivity, sedimentation volumes (Fig. 1), thixotropy coefficient (Fig. 2), and absorption. This anomalous behavior is ascribed to the presence and persistence of carbon to carbon complexes or networks which impede, by competition, the reinforcement reaction while at the same time raising all consistency (absorption) values.

The subnormal properties of thermal carbons as regards modulus, hardness, sedimentation volumes, absorption, and, in particular, bound rubber, are regarded as due to complete inertness; *i.e.*, total absence of either carbon:carbon, or carbon:rubber, complexes.

Rebound Resilience and Surface Area of Carbons

In Figure 3 this curve is assigned a tentative trend based on a foundation of electron microscope determinations interspersed with other surface values derived from color measurements. The examination of any new carbon may well begin with a determination of its resilience properties by means of the Healey-Goodyear Pendulum. This will serve to fix its *general* position in the surface area scale, and so the broad features of its hysteresis and processing properties.

There appears, at least in this tentative curve, a point of inflection in the region of rubber grade impingement carbons. A slight reduction in carbon surface area at this point is repaid by marked increase in rebound resilience and concomitantly by decreased hysteresis and heating-up tendencies under dynamic stresses. The 8 acre point (Stat-ex) appears, in the

light of present knowledge, to combine a surface area which being almost completely *available* (in rubber) provides full reinforcement and road wear, with a higher degree of resilience or freedom from hysteresis than has hitherto been obtainable.

The advisability of any further shift towards still lower surface area carbons will of course depend upon the relative importance of low hysteresis and of full reinforcement. This in turn will be governed by service conditions and by the inherent properties of the rubber itself—natural or synthetic.

In order to portray these relationships more concretely, an attempt has been made to evaluate tread quality under three sets of conditions. The indexes used are somewhat arbitrary, the objective being to fix ideas.

Overall Quality as a Function of Carbon Surface Area—Fig. 4

Road Wear (Energy of Rupture and Shore Hardness): The product of these two quality indexes is regarded by some as the best criterion of abrasion resistance or road wear. Energy of rupture measures overall reinforcement. Shore hardness determines the freedom from excessive crawl or squirm*, which appears to be a *sine qua non* of maximum road wear.

This index indicates a rapid rise from low surface areas up to about the 8 acre point, thereafter a slight but continued rise to 12 acres (and probably beyond). The end point of this curve has not been established. It is suggested that this index broadly depicts road wear performance under non-heating conditions, as for example passenger tires driven at low speeds. The unexpectedly low values for fine thermal and acetylene blacks are ascribed respectively to the absence of carbon:rubber bonding and the competition of persistent carbon:carbon complexes.

Heavy-Duty Performance (Energy, Shore Hardness and Rebound): This index differs from the previous one in that the rebound resilience factor is added. The resulting values represent a compromise between abrasive wear and the conditions induced by excessive speeds, or loads, or both. A maximum or optimum point appears in the 8 acre region. This optimum will shift to the left or to the right, depending on the relative importance ascribed to the wear factor, *per se*, and to low power losses (high rebound resilience). This curve is essentially schematic. Road tests on large

* The authors are indebted to Mr. W. W. Vogt of the Goodyear Tire & Rubber Company for this apt descriptive term.

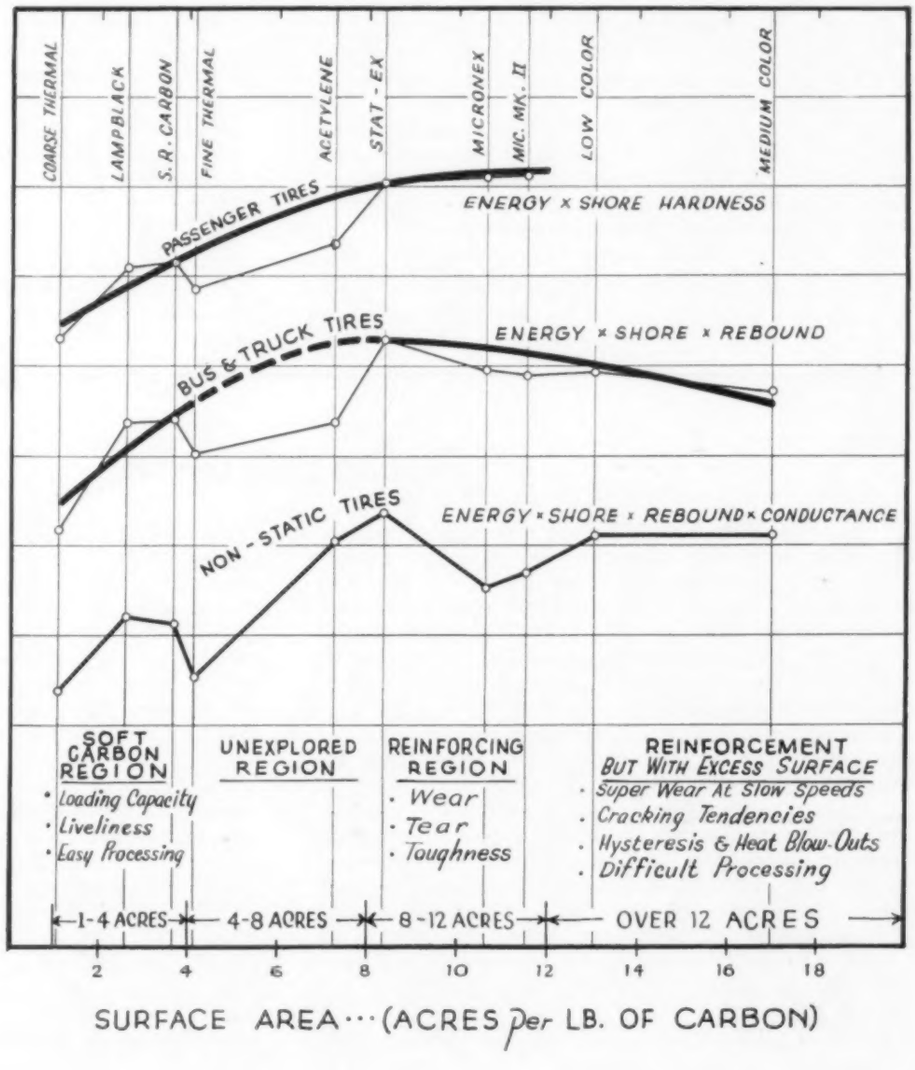


FIG. 4—Carbon Surface and Tread Quality.

truck tires have, however, confirmed the superior performance of a new type of carbon in the 8 acre range.

Electrically Conducting Tread Quality Index (Energy, Shore Hardness, Rebound, and Conductance): This index adds to the previous one the factor of D. C. conductance. An absolute maximum appears in the 8 acre region for a pure carbon (Stat-ex), but two subregions are discernible. In the pure carbon range, increasing surface provides increasing quality, fine thermal carbon displaying a downward anomaly. Amongst the impingement carbons, there is again a rise in quality with increasing surface. The sharp drop from Stat-ex to standard carbon black is due to the appearance of volatile matter in the latter. This drop occurs despite a rise in surface of from 8 to 12 acres. The curve illustrates the contribution of the two chief controlling factors in the development of nonstatic tread carbons, namely, purity and fineness of subdivision.

The attainment of electrical conductance through the use of excessively high surface channel carbons incurs the penalty of high hysteresis and difficult processing.

The Gamut

Inspection of Figure 4 suggests the following broad classification of colloidal carbons available for rubber compounding.

(a) *One to Four Acres—Soft Carbon Region:* Here at the price of low reinforcement are found the outstanding advantages of easy processing, high loading capacity, and liveliness.

(b) *Four to Eight Acres—Terra Incognita:* In general this region may be described as the unexplored area in the colloidal carbon "spectrum." Acetylene black, although in this range, is not deemed a true rubber carbon because of its anomalous behavior.

(c) *Eight to Twelve Acres—The Reinforcing Region:* Here are found Stat-ex and standard reinforcing carbons which impart wear, tear, and toughness to rubber and which have made possible the super-quality tires of today.

(d) *Upwards of Twelve Acres—Reinforcement With Excessive Surface:* In this region a slight improvement in abrasion resistance over (c) is purchased at ever-increasing cost in hysteresis, difficult processing, and boardiness.

Shepard, Street, and Park (*7*) writing in 1937 stated: "It has been pointed out that data are lacking which make it possible to determine whether fineness of division alone produces reinforcement. This problem is one of the most difficult; but if solved, it would throw great light on the whole question of reinforcement."

With the aid of the electron microscope, it is now possible to attempt an answer. Gaps in the carbon "spectrum" may now be recognized. The next step is to fill these gaps so that a complete range of colloidal carbons, from one to twenty acres or more, may be made available.

So equipped, and with access to a chemically controlled carbon surface, the rubber technologist will be better able to meet every problem of reinforcement, of loading capacity, or of processing behavior, whether working with natural rubber or with other elastic polymers.

REFERENCES

(1) U. S. Patent #1,987,980, assigned to Columbian Carbon Co.
(2) Developed by Dr. A. Prebus—Ohio State University.
(3) "The Particle Size and Shape of Colloidal Carbon as Revealed by the Electron Microscope", July, 1940.
(4) *Kautschuk*, January, 1941.
(5) *Ibid*, May, 1941.
(6) Wiegand, W. B., *Canadian Chem. & Process Industries*, November, 1941, pp. 579-81.
(7) "Chemistry & Technology of Rubber", by Davis & Blake, A.C.S. Monograph, page 410.

Glycerized Liquid Lubricant

A MATERIAL which is finding a variety of uses in rubber processing operations is Glycerized Liquid Lubricant (Concentrate), sold by the Rubber Material Division of Genseke Brothers, West 48th Place and Whipple Street, Chicago, Ill. It finds application as a rubber dip, as a lubricant in extruding, as a mandrel and core lubricant, as a mold lubricant, and in washing and finishing procedures.

When diluted in water, Glycerized Lubricant serves as a coating for hot rubber slabs, thus eliminating the need for soapstone or talc. By dipping the slabs in the solution, or by spraying or brushing the solution on the slabs, stickiness is eliminated, separation of piled stocks is assured, and adhesion is nullified. In connection with extruding, tubed stocks can be submerged into a 10 to 20% solution and then can be stacked without danger of adhesion. When the tubing is wound into coils in flat pan vulcanization and subjected to the usual open steam cure, sticking of the stock is prevented.

As a mandrel or core lubricant, the company suggests that the material not be diluted but be used in its original state. Its use in this connection is said to enable stripping of the hose or tubing from the mandrel readily after subjection to the usual curing operation. When used as a mold lubricant, articles are not only easily removed from the molds but due to the high glycerine content of Glycerized Lubricant they retain a desirable gloss. Recommended proportions for this use are from 5 to 10 ounces to each gallon of water.

The final use found for this material in the rubber factory is for washing and finishing. Inner tubes, automotive parts, and other molded and extruded goods are washed and finished readily, according to the manufacturer. Glycerized Lubricant cleans thoroughly and gives the finished product a glossy, satin-like surface. 3 to 5% of concentrate to water is recommended for this purpose. The company emphasizes the fact that this relatively new material is perfectly neutral and non-contaminating to the most exactingly compounded rubber stocks.

Supplementary Order No: M-15-b-1 To Restrict the Use of Rubber

THE complete text of Supplementary Order No. M-15-b-1 to Restrict the Use of Rubber, issued by the Director of Industry Operations of the War Production Board as the first in an expected series of regulations concerning specifications for rubber products, follows herewith:

IT IS HEREBY ORDERED THAT:

940.5. Specifications:

(a) *Applicability of Supplementary Order No. M-15-b (section 940.3).*—This Order is issued pursuant to paragraph (d) of Supplementary Order No. M-15-b (section 940.3) issued by the Office of Production Management. All definitions and all other provisions of Supplementary Order No. M-15-b shall apply to this Order as fully as though set forth herein. Nothing in this Order shall be construed to permit the use of Rubber or Latex in the manufacture of any products except as permitted by Supplementary Order No. M-15-b or by special directions issued by the Director of Industry Operations.

(b) *Specifications for certain rubber products.*—No Person shall use Rubber, Latex or reclaimed rubber in the manufacture of any product included in the Lists enumerated below and attached hereto except in accordance with the specifications therein prescribed; such specifications to be effective as to any product or class of products as of the effective date of this Order except where otherwise specified in the appropriate list (Provided that such restrictions shall not apply to the manufacture of products to fill War Orders or other purchase orders placed by or for the account of any other department or agency of the government of the United States, unless otherwise provided as to any product or class of products in the appropriate list):

(1) Hose and tubing of the kinds listed..... List 1
(2) Conveyor, elevator, and flat transmission belts and belting of the kinds listed..... List 2
(3) Occupational protective clothing (other than footwear and gloves) and rubberized fabric for firemen's and policemen's clothing..... List 3
(4) Jar rings ..... List 4
(5) Plain oxfords and laced-to-toe gym bals..... List 5
(6) Waterproof boots, pacs, arctics, gaiters, and overshoes ..... List 6
(7) Tires, tire casings, tire tubes, and capping stock and compounds therefor..... List 7
(8) Bicycle tires ..... List 8
(9) Tires, tire casings and tire tubes to fill War Orders ..... List 9
(10) Fire hose and mill hose..... List 10

(c) *Effective date.*—This Order shall be effective as of the date of its issuance.

Issued this 11th day of February, 1942.

(P. D. Reg. 1, amended December 23, 1941, 6 F. R. 6680; W. P. B. Reg. 1, Jan. 26, 1942, 7 F. R. 561, E. O. 9024, Jan. 16, 1942, 7 F. R. 329, E. O. 9049, Jan. 24, 1942, 7 F. R. 527; sec. 2 (a), Public No. 671, 76th Congress, Third Session, as amended by Public No. 89, 77th Congress, First Session).

J. S. KNOWLSON
Director of Industry Operations

LIST 1

Specifications for the Manufacture of Certain Types of Hose and Tubing

The following products may be manufactured only in accordance with these specifications and shall contain no Rubber or Latex:

Specifications where reclaimed rubber is used

Description of product	Minimum inside diameter	Maximum outside diameter	Color	Pressure test
(1) Low pressure spray hose	3/8	11/16	Black	250-pound per square inch; 10-minute hold on 3-foot sample.
(2) Curb line and garage air hose....	1/4	5/8	Black	
(3) Curb line and garage air hose....	3/8	3/4	Black	
(4) Fire extinguisher tubing	3/8	3/4	Black	250-pound per square inch; 10-minute hold on 16-inch sample.
(5) Garden hose, 1-ply (the manufacture of 1-ply only is permitted)	5/8	1	Black	300-pound per square inch burst.
(6) Car heater hose, 1-ply (the manufacture of 1-ply only is permitted).....	5/8	31/32	Black	200-pound per square inch burst.
(7) Automotive radiator hose shall be black only with a maximum wall gauge of 3/16-inch				

LIST 2

Specifications for the Manufacture of Certain Types of Conveyor, Elevator, and Flat Transmission Belts and Belting

(1) Conveyor belts and belting and elevator belts and belting shall be manufactured in two grades only, as follows:

(a) Grade A, having a 2,500-3,000-pound cover tensile and a 16-19-pound friction,

(b) Grade B, having a 800-1,000-pound cover tensile, a 12-15-pound friction and no skim coats, and shall have black covers only.

(2) All belts and belting designed for conveying food and grain shall be manufactured in grade B only.

(3) All belts and belting designed for conveying food may have a cover other than black in color.

(4) Flat transmission belts and belting shall be manufactured in two grades only, as follows:

(a) Grade A, having a 20-24-pound friction,

(b) Grade B, having a 12-15-pound friction and no skim coats.

(5) All belts and belting designed to transmit power to any Farm Machinery and equipment (as defined in Preference Rating Order No. P-95) shall be of a grade B quality, except those designed to transmit power to hammermills.

(6) Where flat transmission belts and belting are manufactured in a color other than black, no more rubber shall be consumed than would be consumed in black belts and belting of an equivalent grade.

LIST 3

Specifications for the Manufacture of Occupational Protective Clothing (Other than Footwear and Gloves) and Rubberized Fabric for Firemen's and Policemen's Clothing

(1) Compounds used in the manufacture of the above products shall not contain more than 16 percent rubber by weight.

(2) Single texture rubber-surfaced and friction-lined material for firemen's coats shall not contain more than 18 ounces of such compounds per square yard.

(3) Single texture rubber-surfaced materials for policemen's coats and occupational jackets, pants, hats, aprons and coats shall not contain more than 13 ounces of such compounds per square yard.

(4) Double texture rubber-surfaced material for occupational protective clothing shall contain not more than 12 ounces of such compounds per square yard.

(5) Single texture rubber-surfaced material for occupational double-coated aprons shall contain not more than 20 ounces of such compounds per square yard.

LIST 4

Specifications for the Manufacture of Jar Rings

(1) Compounds used in the manufacture of jar rings shall contain not more than 10 percent rubber by weight and shall be such as to produce not less than 11,000 gross of rings from each long ton (2,240 pounds) of rubber.

(2) Rings shall be cut 12 to the inch.

(3) Rings may have a single lip.

(4) With respect to internal diameter, width of flange, tensile strength and ultimate elongation, rings shall meet minimum requirements of dimensions, strength and elongation as set forth in Federal Specification ZZ-R-351.

LIST 5

Specifications for the Manufacture of Plain Oxfords and Laced-to-Toe Gym Bals

(1) These products shall have tops of fabric only and rubber shall be used only for outsoles, boxings, toe caps, toe guards, bonderizers, compounds for inside bottom work.

(2) The average amount of rubber per pair used in the manufacture of these products shall not exceed the indicated weights in the case of each of the following types:

Type:	*Maximum average weight of rubber (in pounds)*
Men's	0.25
Boys'	.20
Youths'	.15
Women's	.20
Misses'	.15
Child's	.10

LIST 6

Specifications for the Manufacture of Waterproof Boots, Pacs, Arctics, Gaiters, and Overshoes

(1) All such products shall be manufactured in a black color only.

(2) No rubber shall be used for label plasters.

(3) Production shall be confined to the following types, and the average amount of rubber per pair used in the manufacture of each type shall not be greater than the indicated maximum weight:

	Av. Wgt. of rubber (in pounds) maximum
Boots:	
Men's short	1.25
Women's short	.75
Men's storm king	2.00
Men's hip	2.30
Pacs:	
Men's 12-inch top-lace pac	1.05
Men's lumber overs, half heel	.80
Arctics:	
Men's 5-buckle rubber midweight bal	1.15
Men's 4-buckle rubber midweight bal	1.05
Men's 4-buckle cloth farm-weight blucher	.90
Men's 4-buckle height lightweight bal.-rubber	.75
Boys' 3-buckle height lightweight bal.-rubber	.62
Youths' 3-buckle height lightweight bal.-rubber	.53
Women's 4-buckle height lightweight bal.-rubber	.54
Men's 4-buckle height lightweight bal.-cloth	.65
Gaiters:	
Women's 2-snap rubber	.30
Misses' 2-snap rubber	.30
Child's 2-snap rubber	.27
Rubbers:	
Men's storms and/or semistorms	.60
Boys' storms and/or semistorms	.50
Men's storms and/or S. A. overs (full lined)	.35
Boys' storms and/or S. A. overs (full lined)	.30
Youths' storms and/or S. A. overs (full lined)	.25
Women's storms and/or S. A. overs (full lined)	.25
Misses' storms and/or S. A. overs (full lined)	.20
Child's storms and/or S. A. overs (full lined)	.20

LIST 7

Specifications for the Manufacture of Tires, Tire Casings, Tire Tubes and Capping Stock and Compounds Therefor

(a) Compounds

Description of product: Type	Grade	Maximum per cent by volume: Rubber	Whole tire reclaimed rubber
(1) Tread and capping stock compounds	A	73	0
	B	59.5	17.5
	C	47.9	31.4
	D	40.4	41.3
	E	26.0	57.0
	F	0	89.3
(2) Passenger friction compounds	A	93.8	0
	B	78.0	15.2
	C	59.8	34.2
	D	43.2	50.3
	E	18.8	73.1
	F	0	90.2
	FF	6.4	85.0
(3) Truck friction compounds	A	88.5	0
	B	77.0	9.3
	C+	68.4	21.7
	C	59.8	34.2

Variations from the above specifications are permitted as follows:

Rubber	Plus 0	Minus 2
Whole tire reclaimed rubber	Plus 2	Minus (not limited)

In the event that no friction compound or tread compound in use by any person on January 26, 1942, contains as large a percentage of rubber as specified above, such person shall not use or adopt the grade A friction compound or the grade

A tread compound without the prior approval of the Director of Industry Operations.

The specifications set forth in this subdivision (a) shall become effective not later than February 16, 1942.

(b) Tire casings and solid tires

The friction and the tread, respectively, of each of the classes of tire casings and solid tires listed below shall be made from one of the grades of compounds listed in subdivision (a) of this list, the appropriate grade of compound to be used for each such respective friction or tread being that hereinbelow specified therefor opposite the description or designation of such class (provided that in no event shall any such tire herein required to be made of both grade F friction compound and grade F tread compound contain more than one pound Rubber):

Passenger Friction

Description of product	Compounds to be Used: Passenger friction	Tread
(1) Passenger automobile tires, standard grade	F	F
(2) Passenger automobile tires, premium grade, size 7.50 and larger	B	B
(3) Passenger automobile tires, premium grade, size 7.00 and smaller	C	B
(4) Low pressure road-building equipment tires	E	C
(5) Agricultural equipment tires, garden tractor	F	F
(6) Agricultural equipment tires, implements and tractors, size 6.50 and larger	E	C
(7) Agricultural equipment tires, implements and tractors, size 6.00 and smaller	F	F
(8) Motorcycle tires	C	A
(9) Mileage tires, taxi	C	C
(10) Industrial pneumatic tires	D	C
(11) Industrial solid tires	..	A
(12) House trailer tires	E	F

Truck Friction

	Truck friction	Tread
(1) Truck tires, 17-24-inch rims, size 6.50 and smaller	C+	C
(2) Truck tires, 17-24-inch rims, size 7.00 to 7.50, inclusive, 8-ply and less	C+	C
(3) Truck tires, 17-24-inch rims, size 7.00 to 7.50, inclusive, more than 8-ply, and 7.50-20 8-ply—standard grade	A	C
(4) Truck tires, 17-24-inch rims, size 7.00 to 7.50, inclusive, more than 8-ply, and 7.50-20 8-ply—premium grade	A	A
(5) Truck tires, 17-24-inch rims, size 8.25 and larger—standard grade	A	C
(6) Truck tires, 17-24-inch rims, size 8.25 and larger—premium grade	A	A
(7) Truck tires, 13-16-inch rims, 8-ply and less	C	C
(8) Truck tires, 13-16 inch rims, more than 8-ply	A	C
(9) Off-highway equipment heavy service tires, 8-ply and less	B	C
(10) Off-highway equipment heavy service tires, more than 8-ply	A	A
(11) Mileage tires, city busses	B	C
(12) Mileage tires, intercity busses	A	A

The specifications set forth in this subdivision (b) shall become effective not later than February 16, 1942.

(c) Capping stock

Capping stock of each of the classes listed below shall be made from one of the grades of compounds listed in subdivision (a) (1) of this list, the appropriate grade of compound to be used for each such class being that hereinbelow specified therefor opposite the description or designation of such class:

Description of product	*Tread compound to be used*
1. Capping Stock, 14/32 gauge and smaller	E
2. Capping Stock, 16/32 gauge and larger	A or C
3. Capping Stock, 12/32 and 14/32 gauge, Hawkinson die sizes only	A or C

Capping stock may be manufactured only in gauges of 10/32, 12/32, 14/32, 16/32, 18/32, 20/32, 22/32, and larger.

The specifications set forth in this subdivision (c) shall become effective not later than February 2, 1942.

(d) Maximum material volume of tire tubes

No tire tube of any of the classes listed below shall be manufactured with a material volume in excess of the volume specified for such class as set forth below opposite the description or designation of such class:

Description of product

Type and Size	*Maximum material volume (in cubic inches)*
Passenger automobile tire tubes	
5.50-16	51.2
CD 16	57.8
6.50-15	66.6
7.00-15	72.2
D 16	72
7.50-15	89.4
7.50-16	93.2
A 20/21	42.8
B 17/18	46.9
C 17	56.1
7.00-17	75.2
7.50-17	93.4
Truck tire tubes 15- and 16-inch rims	
6.00-16	65
6.50-16	75
7.00-15	85
7.00-16	89
7.50-15	103
7.50-16	108
9.00-16	191
10.00-16	220
Truck tire tubes 20-inch rims or larger	
6.00-20	75
6.50-20	102
7.00-20	135
7.50-20	175
8.25-20	197
9.00-20	235
10.00-20	300
11.00-20	350
12.00-20	450
13.00-20	525
14.00-20	670
Agricultural equipment tires	
4.00-12	25.3
5.00-15	38.6
6.00-9	36.8
6.00-16	59.0
DM 16	70.5
6.50-32	137.8
FM 24	153.5
8.50-10	....
9.00-28	223.0
HM 28	302.0
KM 28	414.0
5-40	92.5
5.5-40	92.5
6-40	118.0
7-32	112.0

Agriculture equipment tires (cont'd)

8-32	157.0
9-32	220.0
10-28	242.0
11-28	302.0
12-30	385.5
13-30	440.0
14-30	498.0
15-30	595.0

Variations from the above maximum volumes shall be permitted to the extent of minus 3 percent.

Sizes not specifically set forth shall have maximum volumes proportional to the sizes listed.

In the event that the maximum volume herein permitted for a tube of a given type and size manufactured by any person on the effective date of this order is less than the maximum indicated above, such person shall make no change in the maximum volume of such tube as then manufactured by him without the prior approval of the Director of Industry Operations.

The specifications set forth in this subdivision (d) shall become effective not later than March 2, 1942.

LIST 8

Specifications for the Manufacture of Bicycle Tire Casings and Tire Tubes

(1) No bicycle tire casing (designed for use with a separate tube) shall contain more than 1.5 ounces of Rubber.

(2) No bicycle tire tube shall contain more than 6 ounces of Rubber.

(3) No bicycle single tube casing (tire and tube in one piece) shall contain more than 7.5 ounces of Rubber.

(4) In those instances in which lightweight (26 x 1⅜ inches) tire casings and tubes are manufactured to equip new bicycles, either the tire casing or tube may exceed the respective limits set forth in (1) and (2), provided the total weight of Rubber in a tire casing and tube combined does not exceed 7.5 ounces.

LIST 9

Specifications for the Manufacture of Tires, Tire Casings and Tire Tubes to Fill War Orders

(a) Compounds used in the manufacture of tires and tire casings to fill War Orders shall be prepared in accordance with the specifications set forth in subdivision (a) of List 7 attached to this Order.

(b) The friction and the tread, respectively, of each of the classes of tire casings and solid tires listed below shall be made from one of the grades of compounds listed in subdivision (a) of said List 7, the appropriate grade of compound to be used for each such respective friction or tread being that hereinbelow specified therefor opposite the description or designation of such class:

Passenger Friction

Description of product	Compound to be used: Passenger friction	Tread
(1) Passenger automobile tires, size 7.50 and larger	B	B
(2) Passenger automobile tires, size 7.00 and smaller	C	B
(3) Airplane tires, 4-ply and less	B	B
(4) Airplane tires, more than 4-ply	A	A
(5) Motorcycle tires, 18- and 19-inch rims	C	A
(6) Odd size tires, sizes 4.00-12 and 6.50-10	C	C
(7) Industrial pneumatic tires	D	C
(8) Industrial solid tires	..	A

Truck Friction

	Truck friction	Tread
(1) Truck tires, 17-24-inch rims, size 6.50 and smaller and 7.00-20 8-ply	C+	B
(2) Truck tires, 17-24-inch rims, size 7.00 to 7.50, inclusive, 8-ply and less, except 7.00-20 8-ply	B	B
(3) Truck tires, 17-24-inch rims, size 7.00 to 7.50, inclusive, more than 8-ply	A	B
(4) Truck tires, 17-24-inch rims, size 8.25 and larger, 8-ply and less	B	B
(5) Truck tires, 17-24-inch rims, size 8.25 and larger, more than 8-ply	A	B
(6) Truck tires, 13-16-inch rims, size 6.50 and smaller	C	B
(7) Truck tires, 13-16-inch rims, size 7.00 and larger, 8-ply and less	B	B
(8) Truck tires, 13-16-inch rims, size 7.00 and larger, more than 8-ply	A	B
(9) Run flat combat tires	A	A

(c) The skid depths of tires with mud and snow type treads shall be as follows:

Tire size:	*Actual mold measurements in inches*
8.25-10	0.585
9.00-13	.62
15- and 16-inch rims:	
6.00	0.50
6.50	.52
7.00	.535
7.50	.56
8.25	.585
9.00	.62
10.00	.645
11.00	.67
20-, 22-, and 24-in. rims:	
6.00	.50
6.50	.52
7.00	.535
7.50	.56
8.25	.585
9.00	.62
10.00	.645
11.00	.67
12.00	.70
13.00	.74
14.00	.80

Variations from the above measurements shall be permitted to the extent of 0.01 inch plus or minus throughout the mold.

(d) The outside diameters of tires with mud and snow type treads shall be as follows:

Tire dimensions: Diameter	Section	Outside dia. in inches inflated tire: Minimum	Maximum
16-inch rims	6.00	28.60	28.80
	7.50	31.40	31.60
	9.00	35.00	35.30
	10.00	36.50	36.90
20-inch rims	7.00	35.60	35.90
	7.50	36.60	36.90
	8.25	38.10	38.40
	9.00	40.10	40.50
	10.00	41.00	41.50
	11.00	42.80	43.30
	12.00	44.20	44.70
	14.00	48.30	48.90
24-inch rims	14.00	52.30	52.90

(e) Standard tread radii shall be between 80 and 95 per cent of the maximum cross section width of the Tire and Rim Association's standard tire sections.

(f) None of the specifications contained in subsections (c), (d), and (e) above shall be construed to make any change in present dimensions of airplane tires.

(g) Maximum material volumes of tire tubes for passenger automobile tires and truck tires shall be subject to the limitations for those types of tubes as set forth in subdivision (d) of List 7 attached to this Order.

(h) No tire tube of any of the classes listed below shall be manufactured with a material volume in excess of the volume specified for such class as set forth below opposite the description or designation of such class:

Description of product Type	Size	Maximum material volume (in cubic inches)
Combat	6.00-16	65
	7.50-16	120
	9.00-16	190
	7.50-20	160
	8.25-20	190
	9.00-20	220
	10.00-20	250
	10.00-22	275
	11.00-20	318
	12.00-20	370
	14.00-20	525
Lend-lease regular	9.00-13	145
	10.50-16	250
	12.00-20	450
	13.50-20	670
Run flat (rubber-bead-lock)	7.00-18	95
	8.25-10	97
	9.00-16	165
	9.25-16	150
	10.50-16	210
	10.50-20	235
	12.00-20	335
	13.50-20	400

Variations from the above maximum volumes shall be permitted to the extent of minus 3 per cent.

Sizes not specifically set forth shall have maximum volumes proportional to the sizes listed.

(i) *Effective date.*—These specifications shall become effective as follows:

(1) With respect to subsections (a) and (b) with the effective date of this order.

(2) With respect to subsections (c), (d) and (e), at the earliest possible date for each type and size of tire casing specified, depending on length of time required to obtain changed or new molds.

(3) With respect to subsections (g) and (h), not later than March 2, 1942.

LIST 10

Specifications for the Manufacture of Fire Hose and Mill Hose

(1) The following specifications (which, with respect to the use of rubber, are identical with Federal Emergency Alternate Specifications E-ZZ-H-451a) shall apply to the manufacture of fire hose and mill hose.

(2) Fire hose and mill hose shall be manufactured only in the following sizes and the maximum amount of rubber per 100 feet for each size shall not be greater than the amount specified for each size as follows:

Nominal size	*Maximum amount of rubber permitted, per 100 feet, pounds*
1½ inches	4
2½ inches	7
3 inches	8.5
3½ inches	10

(3) The rubber lining shall be made either from calendered sheets of not less than three plies lap-jointed and vulcanized into one solid body, or from a single ply extruded tube. The lap joints of calendered tubes shall be as small as is consistent with best manufacturing practice.

(4) The rubber lining shall be of a thickness not less than 0.04 of an inch at any point when measured on specimens buffed just to the point where the fabric impressions left by the jacket are removed.

(5) Each set of hose couplings shall be provided with three rubber gaskets of good quality. One gasket shall fit accurately the swivel of the couplings, and one (not less than ⅛ of an inch thick) shall be placed under the end of each expansion ring. When the coupling is made up snugly, as in service, the gasket in the swivel shall not be compressed to such an extent as to project beyond the inside surface of the coupling.

(6) The hose shall have an internal diameter as shown by a tapered plug gauge of not less than the nominal size of the hose, except that in the case of 2½-inch hose, the internal diameter so measured shall not be less than 2 9/16 inches.

(7) Unless otherwise specified, hose shall be furnished in lengths averaging not less than 50 feet, measured from back to back of couplings and under a pressure of 10 pounds per square inch. No length before sampling shall be less than 48 feet.

(8) The hose with couplings attached shall meet the following hydrostatic proof pressure test requirements without leakage in the hose or at the couplings or breaking any threads in the jacket.

	Numerical requirements for— Single jacket		Double jacket		
	1½ inch	2½ inch	1½ inch	2½ inch	3 and 3½ inch
Test pressure for initial requirements — pounds per square inch	...	...	10	10	10
Test pressure—pounds per square inch	300	300	400	400	400
Test pressure for kink test—pounds per square inch	...	...	350	350	250
Elongation at test pressure—maximum per cent	...	...	8	8	8
Twist to right—maximum degrees per foot	...	...	29	12.5	12.5
Twist to left—maximum degrees per foot	...	...	0	0	0
Warp—maximum inches	...	...	20	20	20
Rise—maximum inches	...	...	0	0	0

The kink test may be required on only one sample per 100 lengths.

A twist to the right is indicated by a clockwise rotation of the coupling, looking from the hose toward the coupling. A twist to the left is indicated by a counter clockwise rotation. A maximum twist to the left of 2 degrees per foot will be permitted while pressure is being raised, but any final twist must be to the right.

Warp is defined as deviation from a straight line.

(9) A three foot sample, when subject to a burst test while lying straight, shall not burst below the pressure specified in the following table:

Kind of hose:	*Burst pressure, pounds per square inch*
Single jacket	450
Double jacket	600

(10) The hose shall meet the following tests with respect to the rubber lining:

(a) Tensile strength of at least 800 pounds per square inch when tested across the fold.

(b) Ultimate elongation of at least 300 per cent.

(c) Tensile strength, as determined with test pieces ½ inch wide prepared from strips cut transversely across the fold which have been subjected to the action of dry heat of 158° ± 2° F. for 96 hours, shall be not less than 75 per cent of the strength before heating.

(11) The adhesion of the rubber lining to the jacket shall be such that a weight of 8 pounds suspended from a strip 1½ inches wide will cause separation at a rate not greater than 1 inch per minute. This requirement does not prohibit that construction wherein there is no adhesion between the jacket and lining along the fold, provided the surface over which there is no adhesion is not greater than 35 per cent of the total surface.

Regulations on the Sale and Purchase of Crude Rubber, Normal or Concentrated Latex, Deproteinized Rubber and Sprayed Rubber

THE sale and purchase of crude rubber, normal or concentrated latex, deproteinized rubber, and sprayed rubber, are now strictly regulated under the provisions of Amendment No. 3 to Supplementary Order No. M-15-b, issued by the Priorities Division of the Office of Production Management (now the War Production Board) on January 23, 1942. An explanation of these regulations, as well as methods to be followed in the sale and purchase of these materials, is contained in Circular No. 3, issued by the Rubber Reserve Co. on January 31, 1942, and Circular No. 4 (modifying Circular No. 3), issued on February 17, 1942, both of which are reproduced herewith:

Circular No. 3

Reference is made to Paragraph (e) of Amendment No. 3 to Supplementary Order No. M-15-b, issued by the Priorities Division of the Office of Production Management on January 23, 1942, reading as follows:

> *General restriction on the sale of Rubber and Latex:* Until otherwise ordered by the Office of Production Management, no Person shall sell, trade or transfer the ownership of any Rubber or Latex, and no Person shall accept any such sale, trade or transfer of ownership, except (1) as expressly permitted by regulations prescribed by Rubber Reserve Company, or (2) in those cases in which specific authorizations may be issued by the Office of Production Management; provided that nothing in this paragraph shall be deemed to prohibit the sale of unvulcanized rubber products which were in finished and marketable form on December 11, 1941 or which have become finished and marketable at any time after that date pursuant to processing not prohibited by any orders or other instructions issued by the Office of Production Management.

Pursuant to the restrictions on the sale and purchase of Rubber and Latex established by the foregoing Paragraph, the following regulations are prescribed by Rubber Reserve Company.

Sale of Crude Rubber

1. Crude rubber will be sold to manufacturers in accordance with the procedure outlined in Circular No. 1, dated September 12, 1941, which is in effect at the present time, with the added provision, however, that each request for the issuance of a Crude Rubber Purchase Permit must be accompanied by an affidavit, in the form attached hereto designated as Exhibit "A", signed by a duly authorized representative of the manufacturer. A separate affidavit must be executed in connection with each request for a purchase permit, and the affidavit should show the total stocks of rubber on hand, irrespective of grades, at the time of the execution thereof.

2. A sample copy of the Crude Rubber Purchase Permit is attached hereto for informative purposes only, and should not, in any case, be filled out by a manufacturer, since all permits are issued from this office. (EDITOR'S NOTE: A facsimile of this permit is not reproduced herewith, since every rubber manufacturer is familiar with the form.)

Purchase of Crude Rubber from Manufacturers

3. Upon receipt of an appropriate request from a manufacturer, Rubber Reserve Company will arrange for the purchase of the manufacturer's surplus stocks of rubber at a price equal to the amount paid by the manufacturer for the rubber, plus freight, insurance, and charges incurred, if any, for the storage of the rubber in commercial warehouses.

4. Manufacturers owning surplus stocks and wishing Rubber Reserve Company to purchase such stocks should address a letter to the Purchase Department of Rubber Reserve Company, setting out the exact amount of rubber involved, by R.M.A. types and grades, the location of the rubber, and detailed information with respect to the cost thereof. Arrangements will then be made to have the rubber inspected and moved to warehouses for storage. Immediately upon completion of the inspection, and after taking into consideration quality and weight adjustments, if any, the manufacturer should forward to the Purchase Department, Rubber Reserve Company, an invoice certified as to the correctness thereof, covering the price of the rubber, upon receipt of which, after verification, a check will be prepared and forwarded to the manufacturer without delay.

5. It is possible that manufacturers may have rubber on hand which does not conform to the established R.M.A. types and grades, and while this fact does not preclude the sale thereof to Rubber Reserve Company, in such cases, full information should be furnished with respect to the grades involved.

Purchase of Crude Rubber from Dealers

6. Under the terms of Amendment No. 3 to Supplementary Order No. M-15-b, effective February 1, 1942, all sales, trades or transfers of the ownership of rubber are prohibited except as expressly permitted by regulations issued by Rubber Re-

serve Company or specifically authorized by the Office of Production Management. As a result all contracts between dealers and manufacturers unfilled as of February 1, 1942 are automatically cancelled.

7. To relieve this situation, upon receipt of an appropriate request from a dealer, Rubber Reserve Company will purchase the dealer's undelivered stocks of rubber at a price equal to the actual amount paid by the dealer for such rubber, plus freight, insurance, charges incurred, if any, for the storage of the rubber in commercial warehouses.

8. Dealers owning undelivered stocks and wishing Rubber Reserve Company to purchase such stocks, should advise the Purchase Department of Rubber Reserve Company of the stocks on hand, by R.M.A. types and grades, the location of the rubber, and detailed information with respect to the cost thereof. Arrangements will then be made to have the rubber inspected and moved to warehouses for storage. Immediately upon completion of the inspection, and after taking into consideration quality and weight adjustments, if any, the dealer should forward to the Purchase Department, Rubber Reserve Company, an invoice certified as to the correctness thereof, covering the price of the rubber, upon receipt of which, after verification, a check will be prepared and forwarded to the dealer without delay.

9. It is possible that dealers may have rubber on hand which does not conform to the established R.M.A. types and grades, and while this fact does not preclude the sale thereof to Rubber Reserve Company, in such cases, full information should be furnished with respect to the grades involved.

10. The foregoing procedure relates not only to dealer's stocks on hand, but also to rubber afloat and rubber purchased for future shipment, regardless of the origin of the rubber.

Sale of Normal or Concentrated Latex, Deproteinized Rubber and Sprayed Rubber

(The provisions set forth under this title supersede those contained in Circular No. 2, dated September 22, 1941.)

11. With the consent and approval of the Office of Price Administration, the following sales prices are hereby established for Normal or Concentrated Latex, Deproteinized Rubber and Sprayed Rubber, F.O.B. point of shipment. (See Paragraph 2 of Circular No. 4):

	Liquid Latex	
	Normal	Concentrated
Tank Car.....	.2895	.3065
Carload Drums	.3125	.325
Less Carload.....	.3175	.33
Less than 10 Drums...	.3225	.335
Less Drum.....	.3825	.395
Deproteinized Rubber ..... .375		
Sprayed Rubber. .2575		

12. Under the terms of Amendment No. 3 to Supplementary Order No. M-15-b, effective February 1, 1942, all sales, trades or transfers of the ownership of Normal or Concentrated Latex, Deproteinized Rubber and Sprayed Rubber are prohibited except as expressly permitted by regulations issued by Rubber Reserve Company or specifically authorized by the Office of Production Management. As a result all contracts between distributors and manufacturers unfilled as of February 1, 1942, are automatically cancelled. (See Paragraph 1 of Circular No. 4).

13. For the present, at least, Normal or Concentrated Latex, Deproteinized Rubber and Sprayed Rubber will be sold to manufacturers by certain distributors acting under the supervision of Rubber Reserve Company rather than by Rubber Reserve Company acting directly. For this purpose, Rubber Reserve Company has designated the following companies as distributors: United States Rubber Company, General Latex & Chemical Corporation, Revertex Corporation of America, Heveatex Corporation, B. F. Goodrich Company, Goodyear Tire & Rubber Company, Firestone Tire & Rubber Company, Dunlop Tire & Rubber Company, American Anode, and Charles T. Wilson Co., Inc. In order to secure these types of rubber, manufacturers must obtain a permit from Rubber Reserve Company for the purchase thereof, and each request for a permit must be accompanied by an affidavit in the form attached hereto, designated as Exhibit "B".

14. Requests for a permit to purchase these types of rubber should be addressed to Sales Department, Rubber Reserve Company, 811 Vermont Avenue, Washington, D. C., and mailed at least thirty days in advance of the date on which delivery is desired. All requests for a permit to purchase Normal or Concentrated Latex must state clearly the type or types required, the quantity of each type or types in U.S. Gallons and net dry pounds, the percentage of concentration, the desired delivery date and whether delivery will be taken in drums or tank cars. All requests for a permit to purchase Deproteinized Rubber and Sprayed Rubber must state clearly the type of rubber required, the quantity of each type and the desired delivery date.

15. Upon receipt of the manufacturer's request, accompanied by the required affidavit, Rubber Reserve Company will issue a permit in triplicate and forward such permit to the manufacturer by Registered Mail, provided the manufacturer has complied with the established requirements of the Rubber and Rubber Products Branch of the Office of Production Management. If it is indicated in the request that delivery is desired in several lots, a permit will be issued to cover each delivery. The terms "Net Dry Pounds" and "Total Net D.R.C." appearing on the face and the reverse side of the permit refer to Total Solids Pounds.

16. In very case the distributor, after making delivery of the rubber provided for by the permit, will execute the Distributor's Certificate on the reverse side thereof, and immediately return the original of the permit to Rubber Reserve Company. The duplicate copy may be retained by the distributor for its files. The triplicate copy is for the manufacturer's records.

17. In order to maintain the desired control over stocks, it will be necessary for manufacturers who are both distributors and consumers of Normal or Concentrated Latex, Deproteinized Rubber and Sprayed Rubber to apply to this office for a permit covering their own consumption requirements in the same manner as if a purchase were being made from another distributor. A form of affidavit, designated as Exhibit "C", is attached hereto for use in cases of this nature.

18. It is possible that some distributor occasionally will not have sufficient stocks of Normal or Concentrated Latex, Deproteinized Rubber and Sprayed Rubber available to take care of permits issued to its established customers, and in such instances, another distributor with available stocks will be required to fill the permits, although the manufacturer in question may not be one of its regular customers.

19. A sample copy of the permit for the purchase of Normal or Concentrated Latex, Deproteinized Rubber and Sprayed Rubber is attached hereto for informative purposes only, and should not, in any case, be filled out by a manufacturer, since all permits are issued from this office. (EDITOR'S NOTE: A facsimile of this permit is not reproduced herewith, since every user of latex, deproteinized rubber or sprayed rubber is familiar with the form).

Purchase of Normal or Concentrated Latex, Deproteinized Rubber and Sprayed Rubber from Manufacturers

20. Upon receipt of an appropriate request, Rubber Reserve Company will arrange for the purchase from manufacturers of surplus stocks of Normal or Concentrated Latex, Deproteinized Rubber and Sprayed Rubber.

21. Requests of this nature should state clearly the type or types involved, the quantity of each type or types in U.S. Gallons and net dry pounds, the percentage of concentration, the location thereof, the actual purchase price of the commodity, plus freight, insurance and charges incurred, if any, for storage in commercial warehouses, and the name of the distributor from whom the latex was originally purchased.

22. Arrangements will also be made for the purchase of surplus stocks of compounded latex upon receipt of full information in connection therewith.

Inventories

Paragraph (h) of Amendment No. 3 to Supplementary Order No. M-15-b, issued by the Priorities Division of the Office of Production Management, reads as follows:

Limitation of inventories:

No Person shall receive delivery of Rubber or Latex, or products thereof, in the form of raw materials, semi-processed materials, finished parts or subassemblies, in quantities which shall result in an inventory of such material in excess of a minimum practicable working Inventory, taking into consideration the limitations placed upon the production of Rubber or Latex products by this Order.

In the opinion of the Rubber and Rubber Products Branch of the Office of Production Management and Rubber Reserve Company, a sixty days' supply of Rubber or Latex constitutes a practicable working inventory. For this reason, attention is particularly called to the statement contained in the affidavits (Exhibits "A" and "B") with respect to inventories.

In connection with crude rubber, however, it is possible that while a manufacturer's total inventory may represent more than a sixty days' supply, certain grades of rubber, not represented in such inventory, are needed to meet processing requirements. In cases of this nature, if other grades cannot be substituted, Rubber Reserve Company will give consideration to the issuance of a permit to purchase additional rubber but the request should be accompanied by a letter fully explaining the situation.

Exhibit "A"

Affidavit

I, ..., do hereby certify that I am
(Name)
..... of .....;
(Title or Position) (Name of Manufacturer)
that said manufacturer will require ..... tons of rubber (in addition to inventories of ..... tons of rubber now on hand) during the period from ....., 194. to ....., 194. for the manufacture of products in the manufacture of which rubber may be used under the provisions of Supplementary Order No. M-15-b, as amended, issued by the Office of Production Management or other official instructions of the Office of Production Management; that such rubber, together with inventories of rubber now on hand, is to be used for the manufacture of such products and for no other purpose; that the amount of rubber which said manufacturer will use, consume or process during such period will not exceed the limitations upon the use, consumption or processing of rubber imposed by said Supplementary Order No. M-15-b, as amended, and any other instructions issued by the Office of Production Management. I further certify that, at the end of the period referred to above, total stocks on hand will not be in excess of a practicable sixty day working inventory.

.....
(Signature)
Subscribed and sworn to before me this .... day of..... 194..

.....
(Notary Public)

Exhibit "B"

Affidavit

I, ..., do hereby certify that I am
(Name)
..... of .....
(Title or Position) (Name of Manufacturer)
that said manufacturer will require.....
(State quantity in U.S. Gal-
.....
lons and net dry pounds, and percentage of concentration)
(in addition to inventories of ..... tons of rubber now on hand during the period from ....., 194. to ....., 194. for the manufacture of products in the manufacture of which rubber may be used under the provisions of Supplementary Order No. M-15-b, as amended, issued by the Office of Production Management or other official instructions of the Office of Production Management; that such rubber, together with inventories of rubber now on hand, is to be used for the manufacture of such products and for no other purpose; that the amount of rubber which said manufacturer will use, consume or process during such period will not exceed the limitations upon the use, consumption or processing of rubber imposed by said Supplementary Order No. M-15-b, as amended, and any other instructions issued by the Office of Production Management. I further certify that, at the end of the period referred to above, total stocks on hand will not be in excess of a practicable sixty day working inventory.

.....
(Signature)
Subscribed and sworn to before me this ..... day of..... 194..

.....
(Notary Public)

Exhibit "C"

Affidavit

I, ..., do hereby certify that I am
(Name)
..... of .....
(Title or Position) (Name of Manufacturer)
that said manufacturer will require.....
(State quantity in U.S. Gal-
....., dur-
lons and net dry pounds, and percentage of concentration)
the period from..... 194. to ..... 194. for the manufacture of products in the manufacture of which rubber may be used under the provisions of Supplementary Order No. M-15-b, as amended, issued by the Office of Production Management or other official instructions of the Office of Production Management; that such rubber, together with inventories of rubber now on hand, is to be used for the manufacture of such products and for no other purpose; that the amount of rubber which said manufacturer will use, consume or process during such period will not exceed the limitations upon the use, consumption or processing of rubber imposed by said Supplementary Order No. M-15-b, as amended, and any other instructions issued by the Office of Production Management.

.....
(Signature)
Subscribed and sworn to before me this ..... day of..... 194..

.....
(Notary Public)

Circular No. 4

1. Amendment No. 3 to Supplementary Order No. M-15-b, issued by the Priorities Division of the Office of Production Management on January 23, 1942, and Circular No. 3, dated January 31, 1942, issued by this Company (the Rubber Reserve Co.) pursuant to said Amendment No. 3, prohibit the delivery of Crude Rubber, Latex, Deproteinized Rubber and Sprayed Rubber in the performance of executory contracts in effect at the close of January 23, 1942. In view of the fact that the prohibition of all such deliveries would result, in many cases, in undue hardship, this company, with the approval of the Rubber and Rubber Products Branch of the War Production Board, has decided to remove, and does hereby remove, the aforesaid prohibition, the objective sought being to permit all such contracts to be performed in accordance with their terms provided only, however, that prior to any such delivery (a) the person to whom delivery is to be made shall have first obtained an appropriate permit from this Company in the manner set forth in Circular No. 3 and in the pertinent provisions of Circular No. 1 which were incorporated by reference into Circular No. 3, and (b) all of the procedure with respect to permits is followed as therein set forth.

2. The schedule of prices set forth in Paragraph 11 of Circular No. 3, dated January 31, 1942, is hereby amended, and the prices listed therein for the sale of normal and concentrated latex, deproteinized rubber and sprayed rubber are, until further notice, reduced by three cents ($0.03) per pound.

3. Paragraphs 3, 7 and 20 of Circular No. 3, dated January 31, 1942, which relate to the purchase by Rubber Reserve Company of surplus stocks of rubber and latex from dealers and manufacturers are amended to provide that requests for the purchase of such stocks must be forwarded to Rubber Reserve Company not later than March 15, 1942.

4. Amendment No. 3 to Supplementary Order No. M-15-b, issued by the Priorities Division of the Office of Production Management under date of January 23, 1942, provides that manufacturers who make cement to be used in the manufacture of new shoes are permitted to consume during any calendar month, beginning with February, 1942, not more than 70% of their average monthly consumption of latex in producing the same product during the twelve months' period commencing April 1, 1940, and ending March 31, 1941. In view of the foregoing, Rubber Reserve Company, upon receipt of a request, accompanied by an appropriate affidavit, will issue permits to manufacturers for the purchase of latex to be used in the manufacture of cement.

Amendment No. 5 to Supplementary Order No. M-15-b

SUPPLEMENTARY Order No. M-15-b is hereby amended by substituting the attached lists designated A, B, C and D for lists A, B, C and D, respectively, now attached to such Order.

This Order shall take effect on March 1, 1942.

Issued this 28th day of February, 1942.

J. S. KNOWLSON
Director of Industry Operations

LIST "A" (REVISED EFFECTIVE MARCH 1, 1942) TO SUPPLEMENTARY ORDER NO. M-15-B, AS AMENDED.

Group 1—125 Per Cent

Belt Splicing and Repair Material; Concentrator Belts; Conveyor Belts; Elevator Belts; Industrial Brake Linings and Clutch Facings; Polishing Belts; Screen Diaphragms.

Group 2—100 Per Cent

Cleats and Bucket Pads; Hatters' Belts; Last Puller Belts; Pulley Lagging; Round Belts; Street Sweeper Belts.

Group 3—100 Per Cent

V-Belts (non-automotive).

Group 4—80 Per Cent

Flat Transmission Belts; Hog Beater Belts.

Group 5—125 Per Cent

Acid Hose; Chemical Hose; High Pressure Hose; Jetting and Hydraulic Hose; Railroad Hose (all types); Rotary Drillers Hose; Sand Blast Hose; Wire Braid Hose.

Group 6—100 Per Cent

Air Drill Hose; Dredging Sleeves; Industrial Vacuum Hose; Oil Suction and Discharge Hose; Pneumatic Hose; Spray Hose (except low pressure); Steam Hose; Suction Hose; Welding Hose.

Group 7—80 Per Cent

Brewers' Hose; Gasoline and Oil Tank Wagon Hose; Sanitary Hose.

Group 8—40 Per Cent

Fire and Mill Hose.

Group 9—140 Per Cent

Rubber Lined Tanks, drums, pipes and fittings (hard and soft).

Group 10—100 Per Cent

Hard Rubber Pipe and Fittings; Rubber Buckets, Pails, Dippers, Funnels, measures, bottles, beakers, frames, baskets, racks, trays (for handling corrosive materials); Rubber-Insulated Fume-Ducts, Fans, racks, frames, trays, screens, pipe, buckets, pails, dippers, agitators, funnels and measures (for handling corrosive materials); Rubber pumps, pump lining, valves and parts; Rubber covered rolls and roll coverings (except wringers, printers', fingerprint and business machines).

Group 11—125 Per Cent

Storage Battery Parts (including only separators, retainers, binding strips, element support rods, tie rods, plate support rods, hand-built jars and containers excepting those for automotive starting and lighting batteries); Hard rubber sheets, rods, and tubing (for dielectric purposes); Insulated Tools; Magneto Parts; Mine safety battery parts; Mine safety lamp parts; Respirators, hose masks, gas masks, goggles, inhalators, skull guards (mining and industrial types).

Group 12—125 Per Cent

Cable splicing compound (including necessary cement).

Group 13—100 Per Cent

Chute lining (including lining for sand blast chambers); Oil Well specialties (packers, testing, lining, bumper and swab rubbers; blow-out preventers; drill pipe protectors; stabilizers; slush pump pistons and liners; mud and oil pump pistons and liners; mud and oil pump pistons, valves and parts; valve cups; strippers; stuffing box rings); Press die pads; Sheet, strip and mechanical packings; Vibration dampers (non-automotive).

Group 14—100 Per Cent

Airplane de-icer parts; Card clothing; Gaskets and washers (not elsewhere listed) necessary for use with products in lists "A", "B", "C", and "D"; Gas main bags; Hat forming bags; Lineman's protective devices (line hose, insulator hoods, blankets, cable and test caps and separators, insulating stools); Locomotive drive units; Loom pickers, lug straps, bumpers, holdups and spinning cots; Mine ventilating tubing; Molded, extruded and lathe-cut goods and tubing (not elsewhere listed) constituting component parts of machinery for the processing and fabrication of raw and semi-finished materials and for the transmission of mechanical power; Pipe coupling rings; Pipe lining discs; Shoe diaphragms; Stuff pump balls.

Group 15—80 Per Cent

Finger print rolls; Cutting rubbers; Offset and Newspaper blankets; Printing plates (including cements but excluding rubber stamps, box dies, band daters and toy stamps); Printers rollers; Suction cups for printers equipment; Rubber solution for wet plate negatives.

Group 16—40 Per Cent

Engravers' rubber (including necessary cements).

Group 17—140 Per Cent

Couplings for pasteurizers and milk bottle and can washers; Gaskets for milk separators and clarifiers; Milk bottle filler rubbers; Milking machine inflations and tubing.

Group 18—160 Per Cent

Abrasive wheels.

Group 19—70 Per Cent

Flush valve balls; Washers, including fuller balls and diaphragms, for controlling the flow of fluids; Water meter parts.

Group 20—50 Per Cent

Vacuum cleaner belts.

Group 21—25 Per Cent

Switchboard mats and matting.

Group 22—20 Per Cent

Wringer rolls.

Group 23—75 Per Cent

Automotive Parts: Hydraulic brake cylinder parts excepting boots; Hydraulic brake hose; Air brake hose; Air brake and Vacuum brake parts, excepting boots; Air brake and Vacuum brake hose; Torsional vibration dampers; Clutch facings, brake linings and brake blocks; Shock absorber bushings; Steering post alignment bushings; Pitman arm bushings for independent suspensions; Steering box-to-frame pads for independent suspensions; Windshield wiper blades and Pivot to housing gaskets; Suspension and Torque arm bushings; Engine, transmission and propeller center bearing mountings; Remote control gearshift bushings; Spring bumpers—front and rear; Cements and tie-gums (for bonding rubber to metal only); Sealed beam gaskets; Hydraulic clutch and throttle controls.

Group 24—30 Per Cent

Automotive fan belts (for trucks, busses, tractors and farm implements).

Group 25—100 Per Cent

Full-circle and sectional airbags (for repairing, retreading and re-capping tires).

Group 26—150 Per Cent

Electricians' gloves (including seconds).

Group 27—200 Per Cent

Commercial diving equipment.

Group 28—100 Per Cent

Acoustic aids; Blood pressure bags; Brain surgery caps; Breast pumps; Colostomy outfits; Dental separating strips and mouth props; Dilators; Evacuators; Finger cots (medical, surgical, dental, veterinary and laboratory); Inhalation bags and face pieces (medical, surgical, dental and veterinary); Invalid rings; Irrigators and hard rubber syringes; Medicine droppers; Nipples (feeding); Operating cushions; Orthodontia bands; Parts for medical, surgical, dental, veterinary and mortuary instruments; Pessaries and prophylactics; Prostatic bags; Rubber bands for artificial limbs; Rubber denture suctions and model formers; Surgeons' gloves (medical, surgical, dental, mortuary and veterinary use); Surgical tape, medicated footpads and plasters; Tourniquets; Tubes, tubing, including catheters, stopples and rubber policemen (medical, surgical, dental, mortuary, veterinary and laboratory); Umbilical belts; Urinal—individual wear; Vaccine caps; X-Ray sheets, gloves, aprons and cooling hose.

Group 29—75 Per Cent

Bulbs (medical, surgical, dental, mortuary, veterinary and laboratory); Water bottles and combination syringes.

Group 30—50 Per Cent

Dental dam; Fountain syringes; Hard rubber pipe, connections and accessories (medical, surgical, dental, mortuary and veterinary); Hospital sheeting (hospital, ambulance, mortuary and first aid use only); Ice bags; Metatarsal cushion or pad (not part of shoe); Truss pad cover.

Group 31—50 Per Cent

Cements for the manufacture and repair of shoes (but not the manufacture of component parts, except Gem Duck and Leather Welting).

List B (Revised effective March 1, 1942) to Supplementary Order No. M-15-B, as amended.

Group 1

Compounds for insulating wire and cable.

Group 2

Rubberized fabric for heating pads.

Group 3

Rubberized fabric for firemen's and policemen's clothing and occupational protective clothing, other than footwear and gloves, consisting of industrial pants, coats, jackets, hats and aprons.

Group 4

Waterproof boots, pacs, arctics, gaiters and overshoes (for other than severe occupational uses provided for in Group 5).

Group 5

Steel toe, conductive tread and other boots, mine pacs and heavy waterproof work shoes.

Group 6

Vulcanizing materials, patches, blow-out shoes and similar items for repair of tires and tubes, and cements for repair or retreading of tires and repair of tubes.

Group 7

Thread for: Industrial shoes, belting and flexible metallic hose, Repair cords and webs, Sanitary belts, Supporters (men's athletic), Surgical elastic bandage, Surgical stockings, Surgical supports for abdomen, back and breast, Suspensories, Trusses.

Group 8

Container sealing compounds; Jar rings; Sealing gaskets (cut rings).

Group 9

Pneumatic, solid and cushion tires and tubes (including flaps, cements, airbags and valves) of the following types: Passenger car, Truck and bus (incl. road-builder, earth mover and excavator), Industrial (power-driven vehicles only), Agricultural, Motorcycle, Bicycle, Airplane.

Group 10

Camelback, capping stock, filler strip, stripping stock, cushion stock, lug stock and base stock for retreading and recapping tires.

List C (Revised effective March 1, 1942) to Supplementary Order No. M-15-B, as amended.

Group 1—100%

Blood pressure bags; Colostomy outfits; Finger cots (medical, surgical, dental, mortuary and veterinary use); Inhalation bags and face pieces (medical, surgical, dental, laboratory and veterinary); Irrigators; Nipples (feedings); Operating cushions; Pessaries and prophylactics; Prostatic bags; Sinus and cautery bulbs; Surgeons' gloves (medical, surgical, dental, mortuary and veterinary use); Tubes, tubing, including catheters (medical, surgical, dental, mortuary, veterinary and laboratory use); Urinals—individual wear; Veterinary sleeves.

Group 2—85%

Flat belts; Round belts; V-belts (non-automotive).

Group 3—50%

Cements for the manufacture of shoes (but not for the manufacture of any component parts except Gem Duck and Leather Welting).

Group 4—25%

Latex insulation for fume ducts, fans, racks, frames, trays, screens, pipes and fittings, buckets, dippers, funnels, measures, drums, pumps, valves, baskets and agitators (for handling corrosive material).

Group 5—50%

Industrial rubberized fabric gloves for handling corrosive materials. (Percentage to be reduced to 20% April 1.)

List D (Revised effective March 1, 1942) to Supplementary Order No. M-15-B, as amended.

Group 1

Container Sealing Compounds.

Group 2

Compounds for treating Tire Cords.

Group 3

Meteorological Balloons.

Editorials . . . . . .

Necessity for Synthetic

IN the early stages of the Japanese attacks in the Far East following that on Pearl Harbor it became evident that shipments of crude rubber from that area would fall off sharply. It is doubtful whether the lay public, to which names like Kuala Lumpur, Kota Bharu and Singapore had a romantic meaning only, realized the significance of Japanese advances in this area, and it is likewise doubtful whether those concerned with supplies of crude rubber in the United States realized that practically all of the crude rubber cultivating centers in the Far East would so quickly fall to the Japs. The knowledge that the United States had an immense stockpile of crude rubber, thousands upon thousands of tons were afloat, and a tremendous synthetic rubber program had been announced, lulled even the rubber manufacturing industry into a state of false security.

It is now quite evident that further shipments of crude rubber from the Far East are, for the time being, impossible. The stockpile of crude is still roughly around 600,000 tons. Jesse Jones has stated that the synthetic rubber program will be stepped up to 500,000-ton a year capacity. But the realization that unless the synthetic rubber plants contemplated are actually in operation and producing between 500,000 and 600,000 tons per year by the middle of 1944 there will actually be a deficit in the supply of rubber was forcefully brought home to Congress and the Nation by Leon Henderson, director of civilian supply for the War Production Board and head of the Office of Price Administration, in testimony given on March 5 before the Truman Committee of the Senate which is investigating the entire rubber situation.

Pointing out that the United States must supply rubber, of one kind or another, not only for its own military machine but for those of the rest of the United Nations at war with the Axis powers, in addition to rubber for essential civilian purposes, Mr. Henderson proved with a series of well executed charts that unless synthetic rubber capacity by 1944 reached 600,000 tons and consumption of all rubber used in all products was cut an additional 25% there simply would not be enough rubber to go around. While you can conduct a war with financial deficits, that is, spend more than you take in, you cannot wage war with a deficit in materials.

Mr. Henderson's testimony, and that offered during the past month by others with close knowledge of the rubber situation, bears out what has been repeated time and again in the past several months in these columns, *i.e.*, the necessity for an all-out program on synthetic rubber irrespective of cost and the economic difficulties of post-war. Efforts in connection with guayule and crude rubber from Brazil and other Latin American countries should by all means be furthered, as they are being furthered, but no time should be lost in allocating materials for the production of synthetic rubber plants and for plants to make the basic raw materials needed for synthetic rubber.

The rumor factory in Washington has been buzzing of late of a three-cornered fight among petroleum, chemical and rubber companies to determine which faction shall control synthetic rubber production; of charges that Standard Oil, by virtue of its agreements with I. G. Farbenindustrie of Germany, was hampering the program; of difficulties encountered from manufacturers of industrial alcohol. Whatever truth there may be in any of these reports certainly the government is big enough to sift through them rapidly, eliminate the factors retarding the program, and get immediate action.

The charges against Standard Oil of New Jersey were vigorously defended by W. S. Farish, president of that company, in a statement issued on March 10, just prior to press date on this issue. Mr. Farish in that statement said that patent agreements were arranged and signed with government approval last December covering all questions bearing on Buna. Basic Buna patents have been allowed 1% of the cost of the rubber, or approximately 2½ cents on a $15.00 synthetic rubber tire. Butyl rubber, he said, has been offered to industry and to the government on a royalty-free basis for the duration of the war; thereafter, on a royalty basis to be determined by government authorities.

Mr. Farish also gave some interesting figures on synthetic rubber. For large-scale operations, including the raw materials needed, the investment required to produce Buna is $1,000 a ton of yearly capacity. This would indicate that an investment of $700,000,000 to $800,000,000 in plant capacity would provide sufficient synthetic rubber in the United States for both military and civilian needs. Butyl rubber, he said, could be produced for an investment of approximately $700 a ton on a yearly basis. Of special interest in Mr. Farish's announcement was the inclusion of a statement to the effect that Standard Oil has undertaken to produce for both the United States and Canadian governments a total of over 200,000 short tons of synthetic rubber annually and that this operation should be in full swing by the middle of 1943.

CURRENT NEWS OF THE MONTH

LATEST ORDERS ON CONSERVATION OF RUBBER INCLUDE SPECIFICATIONS FOR MANY PRODUCTS

ORDERS, rules and regulations aimed at the best possible conservation of rubber without creating undue hardships in the rubber industry and in those industries dependent on rubber flowed thick and fast in the past thirty days. Continued Japanese advances in the Far East brought home sharply the conviction that not only would the United States have to take steps to secure its own rubber supplies but would have to become the sole supplier of rubber to others of the United Nations, particularly England. This situation, naturally, has resulted in sharper curtailment orders for the rubber manufacturing industry as well as new regulations pertaining to the rationing of tires and tubes. Still more stringent regulations, for both manufacturer and consumer, are in the offing.

Two major steps were taken by the War Production Board on conservation. Several groups of products which may use crude rubber or latex in their manufacture were added to the eligible lists in Amendment No. 5 to Supplementary Order No. M-15-b, but the same amendment ordered general reductions in the amounts of both rubber and latex permitted to be consumed in specific articles. The amendment substituted four new lists of permitted products and uses, effective March 1.

The new List A, which includes products for which crude rubber may be used to certain percentages, now contains 31 groups, compared with the original list of 19. List B, comprising products for which manufacturers must secure special permission, now includes 10 groups, compared with the previous 5. Lists C and D, covering products in which latex is used, now total 8 groups, compared with 6 in the original order. Most of the additions included in the new lists were made as the result of special appeals from the manufacturers, and all of the articles now on the lists are considered necessary to keep essential industries operating.

Consumption Will Be Smaller

Despite the addition of several articles, and the shifting of some into groups for which a higher rate of consumption is permitted, total rubber consumption under the new lists is expected to be somewhat smaller than under the original order. Examples of increases in permitted consumption rates are rubber-lined tanks, pipes and fittings, which may now use rubber at a rate of 140%, compared with 100% under the previous order, and electricians' gloves, 200% against only 100%. Among reductions are fire and mill hose, which drops from 180% to 40%, and conveyor belts, from 140% to 125%.

An addition to List B, covering products for which permission to use crude rubber must be secured, is thread for industrial shoes, sanitary belts, and surgical supports. Also on this list are rubber fabrics for police and fire clothing, which were formerly on List A at a 60% rate. Camelback, too, is now on List B. The full text of the amendment, giving the new lists and the percentages permissible, is reprinted in full on page 445.

No Rubber for Corsets

Although thread for industrial shoes, sanitary belts and surgical supports may now be manufactured under the terms of the new amendment, after permission has first been secured from the War Production Board, corsets, brassieres and foundation garments are still excluded from the crude rubber and latex lists, despite earlier reports to the effect that the W.P.B. had decided to allot some rubber for the manufacture of thread used in the production of these products.

To clarify the situation, Arthur Newhall, chief of the Rubber and Rubber Products Branch, and R. R. Guthrie, chief of the Textile Branch, both of the W.P.B., issued a special statement on February 26, in which they stated that the decision not to make any rubber available for thread for the manufacture of corsets, girdles, brassieres and foundation garments for general use, is in accord with other decisions to eliminate rubber from all civilian products. Provision will be made, the statement continued, for surgical-type garments to be manufactured in accordance with specifications being prepared by the Textile Branch.

According to Daniel L. Jones, vice-president of the Associated Corset & Brassiere Manufacturers, Inc., that industry has at least a three-months' supply of rubber thread on hand and this, combined with the fact that department stores are carrying inventories 20 to 30% higher than last year, means that there will be sufficient supplies on hand for at least six months. Present manufacturing practices will be continued until the available supply of rubber thread is exhausted.

Ruling on Unvulcanized Scrap

Incidentally a ruling by the War Production Board, issued as Amendment No. 4 to Supplementary Order No. M-15-b, which became effective on February 19, made available limited supplies of certain types of scrap rubber for use in less essential civilian articles by removing unvulcanized scrap rubber compounds from the definition of rubber. Such compounds are largely unusable for products permitted under the original M-15-b order or Amendment No. 5 to that order. Unvulcanized scrap rubber can now be used for the manufacture of any product without restriction.

The second major conservation step was contained in Supplementary Order No. M-15-b-1, issued on February 11, brief reference to which was contained in the previous issue of RUBBER AGE. This amendment outlines specifications limiting the percentages of crude rubber in compounds used for the manufacture of a wide variety of rubber products and will result in savings of at least 25,000 tons of rubber a year.

Order Is Preliminary Step

Drafted by technical experts in the Rubber and Rubber Products Branch of the War Production Board, after consultation with industry engineers, the specifications are but a preliminary step in a plan to regulate the consumption of crude rubber in practically all permissible rubber products. The initial order covers 10 classes of products, as follows: Hose and tubes; conveyor, elevator and flat transmission belts; occupational and protective clothing; jar rings, tennis and gym shoes; waterproof boots, pacs, arctics, gaiters and overshoes; tires, casings and tubes and retreading materials; bicycle tires; fire and mill hose; and tires, casings and tubes to fill designated war orders.

Most of the savings to be accrued under the initial specification order—at least 10,000 tons of rubber annually—will be accomplished under the specifications for tires and tubes and retread-

ing materials, principally camelback. Civilian tires will have at least 15% less natural rubber. As indicated in the list of ten classes of products covered by the specifications regulations, separate specifications are set forth for tires and tubes to fill war orders. The full text of the supplementary order showing specifications decreed for this first group of products appears on page 437 of this issue.

Other Conservation Measures

Conservation of rubber also received attention in other quarters. It is known that rubber manufacturers in the Akron area, as well as in other sections of the country, are cooperating with Army engineers in efforts to reduce the amount of rubber required for tanks and combat vehicles. Major General Charles M. Wesson, chief of Army Ordnance, announced in Washington on February 26 that many of these efforts were proving successful. Non-rubber padding for use in tank hulls and turrets is said to be assured.

Specifications for every item of soldiers' footgear have been changed substantially, according to an announcement from the War Department. In this connection the Quartermaster Corps has been conducting a large-scale study in cooperation with the W.P.B. and the Rubber Manufacturers Association. Notable savings are being made in the manufacture of overshoes, rubber-top and knee-length boots, arctics and ski-boots. On certain items it has been found that savings in crude rubber amounting up to 50% could be made by omitting or reducing the rubber content of certain Army "super-specifications." Wherever possible, rubber heels are being eliminated in Army footgear, including cavalry and ski boots.

In certain specific items, however, rubber has been found to be indispensable for wear and comfort. In the case of the new "carbon tap" sole for service shoes, for example, tests show a wear of 2 to 5 times as long as that given by the standard leather sole under identical conditions. To date, procurements totalling approximately 6,000,000 of these special soles have been made, with large deliveries scheduled for the next few months. The new tap sole is a half sole, made of crude and reclaimed rubber and carbon black. It is sewed and nailed to a regular leather single sole to give more wear and traction. According to the Quartermaster Corps, the new sole is the greatest improvement in service shoes in Army history.

Expanded uses for reclaimed rubber enter the news almost daily. Shortly after the use of natural rubber and latex was restricted to the production of military items and a few essential civilian products, several small manufacturers making non-essential products curtailed production or closed their plants, while the larger manufacturers shifted production to essential items. These plants and departments, however, are for the most part again in the production stage, using reclaim on which there is as yet no restriction. A warning that the consumption of reclaim may have to be regulated, however, has already been sounded by official Washington.

Among products now being made of reclaim are the following: belting, including automotive V-belts; radiator and garden hose; service station air hose; perforated mats; office chair cushions and mats; matting; gaskets; hat block gum; stamp gum; carpet sweeper tires; bottle cap liners; heels; crutch tips; stationers' goods, including key caps, platens, telephone cord covers, caster cups, impression rollers, bands and erasers. The rubber in the all-reclaim heels now being made by Goodyear for civilian use is said to be as fully resilient and will wear longer than other materials available for the production of such heels. Because the all-reclaim heels will be made in black only, shoe manufacturers are bringing out two-tone shoes to meet the situation.

Manufacturers of athletic equipment are also experimenting with reclaim. Several manufacturers of tennis balls have developed an all-reclaim ball which, though not so lively as one made with crude, will be fully serviceable to the average player. They will last as long as ordinary tennis balls, since wearing quality depends almost entirely on the felt, not on the rubber. Progress is also reported in the development of an all-reclaim core for baseballs, as well as the use of reclaim for squash balls. No solution has yet been found to the golf ball problem.

Status of Reclaimed Rubber

Word relative to the status of reclaimed rubber came from two sources during the month. Dr. R. P. Dinsmore, development manager of Goodyear, told the Cleveland Section of the Society of Automotive Engineers at Cleveland on February 9 that there is an adequate amount of reclaim available to make enough tires to keep necessary traffic moving until stocks of synthetic rubber can be developed. He said that reclaimed rubber has been made into very good tires that will serve well from 6,000 to 8,000 miles, but though there are adequate stocks they have not been made available because the government wants all possible tires retreaded first and wants to impress the population with the seriousness of the tire shortage. (EDITOR'S NOTE: This statement was made before Leon Henderson's testimony before the Truman Committee, discussed later in this story).

John W. Whitehead, president of Norwalk Tire, testifying before the Senate's "little business" committee on March 5 claimed that 35,000,000 tires could be put back into service through independent dealers with the use of only 80,000 tons of reclaim. He urged the use of "victory" camelback for civilian tire reclaiming, stating that the use of only two ounces of crude rubber to a tire "means reconditioning for at least another 5,000 miles." O.P.A. officials, present at the hearing, said they have been considering the question of a retreaded tire for civilian consumption. (EDITOR'S NOTE: Mr. Whitehead's testimony was given on the same day that Mr. Henderson appeared before the Truman Committee).

Although manufacturers of non-essential products made of rubber are turning to reclaimed rubber wherever possible, manufacturers of latex products and those using latex in the manufacture of miscellaneous products are faced with the problem of rapidly dwindling supplies. Several manufacturers using latex as a component material have already switched to substitute products. The Dewey & Almy Chemical Co. and the Brown Co., both manufacturers of insoles and other shoe products, and both formerly large users of latex as a bonding agent in the production of such items, have introduced non-latex insoles. Although neither concern would comment on the bonding material now being used, it is known that they are synthetic resins. These new bonding agents, it is stressed, are not makeshift materials, but the result of research conducted for some time for use in just such emergencies.

The I. B. Kleinert Rubber Co., one of the larger companies in the notion and novelty field, has met the situation by designing and introducing a number of rubberless products. These include a colorful turban for beach wear, which is waterproof; a new type of beach bag with "Air-lite" linings, also waterproof; a new type of play shoe with a leather sole; and twin-print water-repellent shower and matching window curtains, in rayon or chintz. All of these products formerly used rubber in their manufacture. The Quartermaster Corps has already announced that it will accept raincoats using synthetic resins as the water-proofing agent in place of rubber, and the Marine Corps has agreed to purchase water bags in which a synthetic water-proofing compound is substituted for rubber.

Issue Warnings on Situation

To impress the public with the seriousness of the crude rubber situation, a joint statement was issued by Donald M. Nelson, chairman of the War Production Board, and Jesse Jones, Secretary of Commerce, on February 14. Pointing out that we have a large stockpile on hand, more crude rubber is coming in, and the synthetic rubber program has been started, the statement also emphasized the fact that with all this there is barely enough rubber for our military machine during the next two years. The statement stressed the fact that rationing of rubber is "an absolute military necessity" and "civilian use must be held to the absolute minimum."

The situation was put into stronger

terms by Leon Henderson, in his dual capacity as director of civilian supply of the W.P.B. and head of the Office of Price Administration, in testimony given on March 5 before the Senate Committee Investigating National Defense Activities (the Truman Committee). He declared that America's war needs for rubber would not allow a single pound for the country's 30,000,000 automobiles. (EDITOR'S NOTE: It is believed that this statement applied to the manufacture of passenger car tires and not to the manufacture of camelback for retreading. Regulations concerning the amount of passenger car camelback manufactured monthly are issued by the W.P.B. None was made available in either February or March).

Private Tires May Be Taken

The daily press made capital of Mr. Henderson's statement referring to the possible commandeering of private tires. What Mr. Henderson actually stated was this: "If we don't use extreme care in driving speeds, tire inspection and tire maintenance, if we don't campaign vigorously for scrap rubber, and if we don't control the use of reclaim rigidly, we may be faced with the necessity in 1943 and 1944 of severe gasoline rationing to preserve tires or as some have suggested confiscation of tires on private cars. We must insure a certain minimum of passenger transportation."

Allocations of rubber for certain essential civilian uses, the Price Administrator said, which have undergone a recent 25% reduction must be cut an additional 25% or more, not only in the United States but in all of the United Nations, to meet minimum demands for the military and to make the "extremely optimistic" estimates of actual and potential supplies carry the war load. He said that it would almost require a miracle to secure the 300,000 tons of synthetic rubber planned by the end of 1943.

Mr. Henderson presented three tables, giving tonnages of rubber available, afloat, under production and potentially available for the years 1942, 1943 and 1944. The first table indicated the stock position at the end of each year with the supposition that we secure 165,000 tons of synthetic rubber and 1,000 tons of guayule in 1943 and 362,000 tons of synthetic and 5,000 tons of guayule in 1944. The table showed that if demand continued at the present rate of consumption there would be insufficient supplies to go around. The second table, which took into consideration the securing of 300,000 tons of synthetic in 1943 and 600,000 in 1944, still showed insufficient supplies if consumption was continued at the same rate.

The third table, however, indicated that if consumption is cut down by 25% in all classes of users (including U. S. military forces, Lend-Lease, South American Export, U. S. Civilian and the rest of the non-axis world) and supplies in 1943 amount to 135,000 tons of crude, 300,000 of synthetic and 1,000 tons of guayule, and 98,000 tons of crude, 600,000 of synthetic and 5,000 of guayule in 1944, then there will be no deficit in stocks and a situation in which no rubber of any kind is available for any purpose will be avoided. In none of these tables was there any provision for rubber for the nation's 30,000,000 cars.

Questioned about soaring prices for used tires which is creating a major problem in the scrap rubber market, Mr. Henderson indicated that it may soon be necessary to put ceiling prices on the sale of such tires. He said that the O.P.A. was not quite ready to take action on this situation at the present time since sales of used tires now, despite the high prices charged, was filling in an "adjustment gap."

EDITOR'S NOTE: Maximum prices for used passenger car and truck tires and tubes were established on March 10, effective March 16. Full details will appear in the next issue.

In concluding his testimony, Mr. Henderson outlined the seven following major steps being taken or contemplated to meet the tight rubber situation, these being in addition to steps already taken by the War Production Board: (1) Immediate steps to relieve the bottleneck for recapping and retreading and to allow at least 1½ ounces of rubber for this purpose; (2) Possible requisitioning of all existing rubber scrap; (3) Reduction in the amount of crude rubber now used in Class A trucks; (4) Expansion of the reclaimed rubber program; (5) Rationalizing of transportation facilities; (6) Reduction in speed limit to 40 miles an hour; (7) Compulsory inspection service to assure that there is no waste in the use of rubber.

Profiteering on Rubber Goods

In a statement issued on February 28 Mr. Henderson, in his capacity of Price Administrator, stated that buyers themselves can do a great deal in checking profiteering on rubber products by watching prices and withholding purchases in cases where advances appear excessive or unwarranted. He pointed out that many of the rubber products now offered for sale were produced months ago and that in these cases there is no excuse for charging the consumer more than before Pearl Harbor. Rubber has become a symbol of the struggle in the Far East, he said, but there is no justification for using the situation in the Pacific as an opportunity to make unwarranted profits.

Manufacturers of rubber shoe products were requested recently not to increase their net prices on heels and soles as a result of Treasury Decision 5107. This decision, issued by the Bureau of Internal Revenue, applies a tax of 10% on rubber products such as soles and heels. The O.P.A. announced, however, that it will not object to specific addition of the amount of the tax actually paid on any item, provided it is billed separately.

All manufacturers of waterproof rubber footwear met in Washington on March 3 for the purpose of negotiating an agreement on maximum prices for new lines produced under the specifications established by the War Production Board. Such footwear is now being sold at prices prevailing on December 3, 1941, in compliance with an earlier request from the O.P.A. not to increase prices. The proposed new list to which the manufacturers were asked to agree provides for prices no higher than the December 3 levels in any case and for reductions on some items where style features are being eliminated to save rubber. According to a recent statement by C. L. Munch, president of Hood Rubber, rationing of rubber footwear for next fall and winter is a strong likelihood.

Orders Affecting Rubber Industry

Several orders issued by various government agencies in the past month directly affected the rubber industry. Some of these orders pertained to rubber itself while others covered products used in and by the industry. Among these were the following:

(1) All stocks of chlorinated rubber in the United States, except those going into a specified use, were ordered frozen by the Director of Industry Operations on February 23, preparatory to requisitioning by the W.P.B. or diversion into war production. An amendment to General Preference Order M-46 provides that chlorinated rubber may be used only for these purposes: As a paint for interior use in industrial plants where resistance to chemical corrosion is necessary or as a paint in arsenals, for painting ship bottoms and other submarine uses; for flameproofing military fabrics, including tents; for tracer bullets; for adhering rubber articles to metal; and for electrical insulation.

(2) The Board of Economic Warfare of the Office of Export Control announced on March 4 that, with minor exceptions, outstanding general and unlimited licenses for exporting rubber and rubber goods would be revoked on March 7. Distribution of such products is now limited to the most vital needs of countries in which supplies are exhausted. Exports will not be authorized to countries where rubber stocks or substitutes are available.

(3) The manufacture or sale of gas masks and anti-gas devices for protection against enemy attack was banned by the W.P.B. on March 3, unless the masks and devices are actually on order by agencies of the government, including the Office of Civilian Defense, and are built to the Army's Chemical Warfare Service specifications. The order, issued as Limitation Order L-57, also prohibits the delivery or sale of materials, including rubber and synthetic rubber, for use in unapproved masks.

(4) An interpretation of Preference Rating Order P-100, made by the Division of Industry Operations of the

W.P.B. on February 13, made it clear that the order can in no circumstances be applied to deliveries of burlap or rubber for use in highway maintenance, repair or operation. Other critical materials may not be used when less scarce materials can be substituted, it was explained.

(5) Conservation Order No. M-29-b, issued by the W.P.B. on February 14, prohibits the use of tungsten in grinding wheels, gauges, and as a coloring material for rubber, linoleum, paper or other similar materials after May 1. Until that date, use of tungsten in these items is limited to 17½% of the amount used during the year ended June 30, 1941. Tungsten is used in the manufacture of certain lake colors used in the rubber industry.

(6) Sharp curtailment of the use of critical materials in the manufacture of all types of musical instruments, as well as musical accessories, was ordered by the W.P.B. on February 18 in General Limitation Order L-37. Included among the materials listed in the order were rubber and neoprene. The order covers the period from March 1 to June 1.

(7) General Preference Order M-91, issued by the W.P.B. on March 4, allocates the bulk of the nation's output of cotton duck to the armed services and the balance to essential civilian needs. The order stipulates that a specific proportion of cotton duck capacity, now being determined, will be set aside to meet the needs of the civilian economy. It permits deliveries of cotton duck to firms with contracts carrying preference ratings of A-2 and better.

(8) A further increase in zinc pool requirements was announced by the W.P.B. on March 3. Order M-11-i requires that producers in March set aside 50% of their December, 1941, production of high grade and special high grade zinc and 40% of all other grades. Lead free zinc oxide requirements are set at 20% of December production and leaded zinc oxide at 10%. No zinc dust is set aside for the month.

Senate Committee Investigating Situation in Synthetic Rubber

The synthetic rubber situation has been pushed sharply into the public limelight as a result of the sweeping inquiry into the entire rubber program initiated by the Senate Special Defense Committee, of which Senator H. S. Truman, of Missouri, is chairman, on February 17. Hearings, both open and closed, have been held by a special subcommittee, of which Senator Clyde L. Herring, of Iowa, is chairman, and which includes Senators Kilgore (West Virginia) and Brewster (Maine). Practically all high officials of the government concerned with the rubber situation, including Messrs. Jones and Henderson, have already testified before the subcommittee, while plans call for the appearance of leading executives of the rubber industry itself.

Although little information concerning the testimony given at any of the closed hearings with regard to the synthetic rubber situation has as yet been officially issued by the subcommittee, some reports have seeped through. After Jesse Jones had appeared before the committee in his capacity as head of the Reconstruction Finance Corporation, which is financing the construction of the four government-owned plants to be operated by Goodyear, Goodrich, Firestone and U. S. Rubber, Senator Herring stated that the delay in developing the nation's synthetic rubber program was due to the fact that no one wanted to put up the money to provide the plants.

The subcommittee is also investigating charges recently made that the Standard Oil Company by virtue of its agreements with I. G. Farbenindustrie of Germany had set up an international cartel which was hindering the large scale development of synthetic rubber in the United States. Although nothing further has been heard concerning this charge, Senator Herring has made the following statement, "I think we have all the patents and the 'know-how' we need and all we need now is to get the plants built and get started on production." Rumors have also been rife that a three-cornered fight among petroleum, chemical and rubber manufacturers for control of synthetic rubber production has also delayed start of the $400,000,000 program announced by Mr. Jones two months ago. According to a statement attributed to Mr. Henderson, this program "is only a gleam in Jesse Jones' eye."

On the same date that the Truman committee started its closed hearings—February 17—Senator Gillette, of Iowa, introduced a resolution in the Senate to set up a separate committee to investigate the production of synthetic rubber and industrial alcohol. In response to assertions that the investigation authorized by this resolution might overlap the work of the Truman committee, Senator Gillette stated that his proposed program would be supplemental to that of the Truman committee, and that Senator Truman had concurred in this belief.

Senator Norris, of Nebraska, who supported Senator Gillette's resolution, declared that "one of the biggest combinations in the country is doing everything it can to keep agricultural interests out of the field of industrial alcohol production." Both senators said they were convinced that much of the synthetic rubber needed to replace supplies now cut off by the Japanese could be produced from alcohol made from surplus stocks of wheat and corn. Senator Gillette pointed out that the Russians had proved butadiene could be obtained from grain alcohol. Sovprene, the Russian synthetic rubber, is made from this process.

"The important point," Senator Gillette said, "is to see that no one organization gains control of this production. With the stupendous needs for the future, both in war and peace, it is evident that whoever is able to control industrial alcohol and synthetic rubber will be able to dominate a field of tremendous importance to the United States and our citizens."

Resolution Awaits Approval

Senator Gillette's resolution, which has received the approval of the Senate Agricultural Committee, provides for an expenditure of $5,000 to finance a study and investigation of production of alcohol and synthetic rubber from grains, canes, fruits and other agricultural materials. Because an appropriation is involved, the resolution was referred to the Senate Audit Committee which must also give its approval. At this writing (March 7) no decision has been reached by this latter committee.

Expansion of the synthetic rubber program from the original 400,000 ton per year capacity to 500,000 tons per year was indicated by Jesse Jones in testimony before the Cole Oil Conservation Committee of the House of Representatives on February 26. Mr. Jones stated that this amount will meet military demands and leave a modest amount for civilian needs and will require four to six new plants. Ralph K. Davies, deputy coordinator of the Federal Oil Conservation Commission, at the same hearing, testified that the oil industry is "ready to go" in making raw material, principally butadiene, needed for the production of synthetic rubber.

Synthetic Capacity Not Limited

The proposed production of synthetic rubber, Mr. Jones stated, together with stockpile rubber, now estimated at approximately 600,000 tons, the latter used as sparingly as possible, will carry the country through until it can be determined whether we can look to any resumption of natural rubber supply, but, he added, the 500,000 ton per year capacity now contemplated is not necessarily the limit to which synthetic production can be carried. He also stated that the oil and rubber industries have been extremely cooperative in working out the government program.

Mr. Jones, ordinarily a mild-mannered individual, exchanged sharp words with several committeemen during his testimony when questioned closely about the delay in initiating a large scale synthetic rubber program and at one point in the proceedings snapped, "Perhaps Congress would like to take charge." Members of the committee, in summing

up evidence presented before it, said that the bottleneck in the expansion program seemed to lie in the direction of processing plants.

Wright W. Gary, director of refining for the Office of Petroleum Coordinator, told the committee of efforts that have been made to develop methods for producing synthetic rubber and said that it is now possible to produce raw materials for rubber, toluene and aviation gasoline in the same plant. Only 5% of the production would be necessary for the production of 400,000 tons of synthetic rubber annually, he said.

Await Word on New Plants

Although expected momentarily, no official word has been released on the number and location of new plants needed to supply synthetic rubber to match the government's announced plan of 400,000 or 500,000 tons of synthetic per year. It is known, however, that since the start of hearings by the Truman Committee in the Senate the War Production Board has approved priority ratings for equipment needed to construct these plants high enough to guarantee early delivery. Prior to the committee's investigation contractors for construction of synthetic rubber plants were granted an A-1-E rating only.

Based on reports received from various quarters, however, it seems evident that plants will be located in Niagara Falls, Toledo and Los Angeles. If the government restricts the production of synthetic rubber to that from petroleum bases, then a plant near Niagara Falls will probably not be in keeping with the program. If, however, the program includes the production of synthetic from coal and limestone, then Niagara Falls is an ideal location. Incidentally the plant in Niagara Falls being constructed by Goodrich for the production of Koroseal is said to be rapidly nearing completion.

According to unofficial word from Washington, the Defense Plants Corporation is negotiating for the purchase of an 800-acre tract of land, owned by Standard Oil, on the East Bay Shore near Toledo, Ohio, for the construction of a synthetic rubber plant. Although officials of Standard Oil and other oil companies in the Toledo area have refused comment, it is believed that all of Toledo's refineries are cooperating. Toledo already has a large crude and refining capacity and is in production on the new aviation fuel. Business interests have submitted a brief to the effect that Toledo has raw materials available for the production of 2,500 barrels of 100-octane aviation gas per day, equivalent to 250 tons per day of synthetic rubber.

Plant Set for Los Angeles

According to word from Los Angeles, contracts have been issued to the Bechtel-McCone-Parsons Corporation of that city, one of the group of companies affiliated with the Henry J. Kaiser interests on the Pacific Coast, for the construction of three plants for the production of raw materials required for the manufacture of synthetic rubber. Two of these plants would produce butadiene and the other styrene. The R.F.C. is said to have approved a $25,000,000 loan to finance these plants, while a fourth plant, a polymerization unit, which, according to rumor, will be operated by Firestone, will be built adjacent to them by the government.

Henry J. Kaiser operates a company under the same name, with offices in the Latham Square Building, Oakland, Calif. He has built several dams in the west and more recently established a magnesium plant in California. He is also interested in shipbuilding activities on the coast and owns or controls a number of companies engaged in various industrial practices. It has been known for some time that he was interested in getting into the picture of synthetic rubber.

Dewey & Almy Building Plant

It has also been learned that the Dewey & Almy Chemical Co., of Cambridge, Mass., is constructing a plant for the manufacture of synthetic rubber of the Buna S type and that this plant is scheduled for completion late this spring. The complete output of the plant, the productive capacity of which has not been learned, will be used to replace much of the crude rubber necessary for essential rubber products being made by Dewey & Almy. A report from Washington states that the Seiberling Rubber Co., of Akron, is negotiating with the War Production Board regarding a synthetic rubber plant to be built and operated by that company.

More News on "Schoch Rubber"

The plan advanced recently by Dr. E. P. Schoch of the University of Texas for the production of synthetic rubber from acetylene received further attention last month. Equipment for the production of acetylene from natural gas will be installed in or near existing power plants in Texas, according to Dr. Schoch. The plant will use raw materials of gas and electric energy, the latter only at off-peak loads as it becomes available from other loads, thus taking only the surplus power. The acetylene thus produced would be shipped to one or more central plants where it would be converted into synthetic rubber by known processes.

Senator O'Daniel, of Texas, has proposed the organization of two companies, one to be wholly or partially financed by private capital, the other to be financed through the Reconstruction Finance Corp. The first company, which would produce the acetylene, would require between $5,000,000 and $10,000,000, while the second, which would convert the acetylene to synthetic rubber, would need approximately $50,000,000.

During the past month it has also been revealed that pooling of patents and technical information by rubber and oil companies in the United States has opened the way for the development of a process to be followed in the manufacture of synthetic rubber at a plant to be constructed near Sarnia, Ontario, Canada. Further details of this contemplated plant will be found in "Canadian News" elsewhere in this issue. Word has also been received from Argentina that a synthetic rubber plant is being planned for construction in that country.

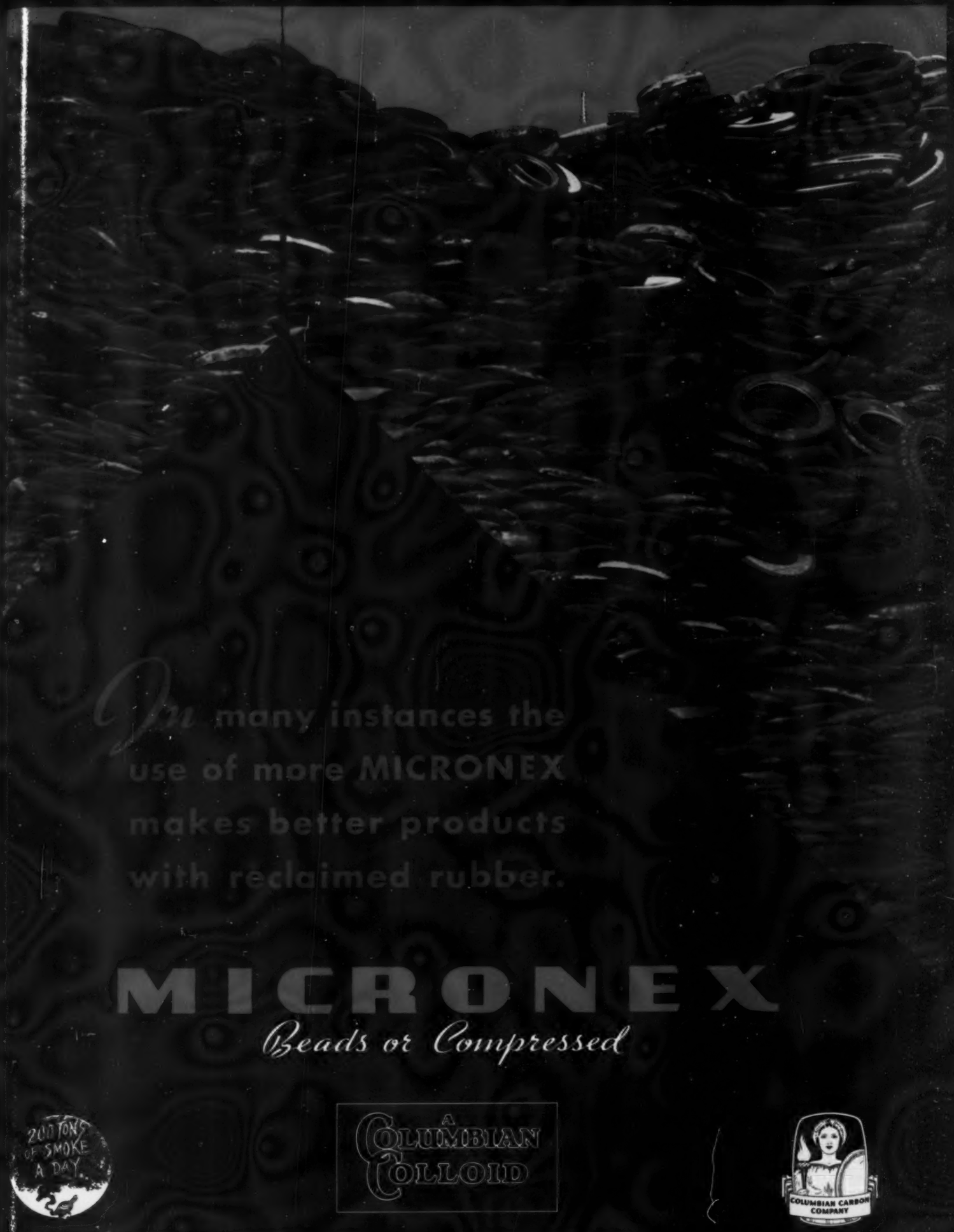
Production of Brazilian Rubber Assured in Exchange of Notes

The best piece of news on the crude rubber situation in the past month was the announcement in Washington on March 3 that several agreements had been signed by Brazil and the United States, one of which provides for the intensive production of strategic materials, including rubber.

The Brazilian Minister of Finance, Dr. Arthur de Souza Costa, and the Acting Secretary of State, Sumner Welles, signed and exchanged notes providing for the establishment of a $5,000,000 fund by the Rubber Reserve Co. to be used in collaboration with the Brazilian Government in developing raw rubber production in the Amazon Valley and adjacent areas. The notes were accompanied by an agreement whereby the Rubber Reserve Co. agreed to purchase Brazilian rubber for a period of five years.

After the rubber project in Brazil has been firmly established, the industry will be further developed and operated with the aid of a portion of a $100,000,000 credit provided for in another series of notes exchanged between the two governments. Expanded assistance will be given to Brazil to enable that country to start active development immediately in strategic materials under the Lease-Lend Act.

The amount of crude rubber which can be secured from Brazil, even under the terms of the new arrangements, is still problematical with estimates ranging from 15,000 to 70,000 tons per year. In a statement made on February 11, Secretary of Agriculture Wickard expressed doubt that any major amount can be obtained from Brazil during the next year or two. He pointed out that one of the major problems is labor, since malaria conditions in rubber growing areas is so bad that few men will work in such areas unless they are guaranteed adequate medical attention and protection. Such protection will undoubtedly be supplied now that the



In many instances the use of more MICRONEX makes better products with reclaimed rubber.

MICRONEX

Beads or Compressed

A COLUMBIAN COLLOID

200 TONS OF SMOKE A DAY

COLUMBIAN CARBON COMPANY

BINNEY & SMITH CO. • COLUMBIAN CARBON CO.

DISTRIBUTOR MANUFACTURER

PLEASE TURN THE PAGE

RECLAIM RUBBER

THE logical approach to formulation of reclaimed rubber starts with consideration of the make-up of the regenerated stock. Hydrocarbon content may be regarded as rubber available for compounding, and carbon, as already present carbon black. When reinforcement is required this provides sound basis for a systematic study of the effect of further loading.

Actually new Micronex is needed for further reinforcement. Even with tire peeling reclaim fresh addition of Micronex exerts its revitalizing effect. Where reclaim is used as an extender in tread compounds maximum wear is attained only when this as well as the new rubber component, is fully reinforced.

Design is as important to tire performance as is compounding. Just as design has been accommodated to full reinforcement of new rubber, so we venture to assert, improved design will make possible hitherto undreamed of performance with synthetic and reclaimed rubber stocks.

•

BINNEY & SMITH CO. • **COLUMBIAN CARBON CO.**

DISTRIBUTOR MANUFACTURER

special arrangements have been concluded.

Secretary Wickard also revealed that in order to get seed from trees deep in the interior for planting in more accessible locations several air expeditions will be sent out soon. Under the program worked out by Nelson Rockefeller, Coordinator of Inter-American Affairs, six technicians are already in Brazil and are engaged in taking inventory of wild rubber resources. Later, these technicians will devote their attention to details of buying, distribution and long-term possibilities of rubber cultivation on a large scale. Under the same program, technicians are also in Colombia, Ecuador, Peru, Bolivia and Central America.

Officials of the Department of Agriculture, including Dr. Elmer W. Brandes, rubber expert of the Bureau of Plant Industry, testifying before the House Appropriations Committee during hearings on the Department's 1943 appropriation bill on March 2, stated that they hoped intensive efforts with wild rubber in Central and South America would produce up to 70,000 tons annually by careful planning and financing, but stated that this would take 18 to 20 months and the price would be higher than the present prices for crude rubber set by the Rubber Reserve Co.

Witnesses at this hearing concurred in the beliefs that consumption of rubber in the United States during the war will amount to approximately 1,000,000 tons annually, that the guayule program would not produce specific results for 2 to 5 years, that synthetic rubber is one of the materials that will have to be turned to, that the visible supply of crude rubber from all Western Hemisphere sources amounted to about 25,000 tons, and that Central and South American supply could be increased by a " big drive" from 75,000 to 100,000 tons annually.

Small Farm Production Urged

Some interesting comments on rubber cultivation possibilities in Latin America were contained in an article on "Small-Farm Rubber Production" by W. E. Klippert, manager of the properties owned and developed by the Goodyear Rubber Plantation Co. in Central America, in the March issue of *Agriculture in the Americas*, monthly publication of the Office of Foreign Agricultural Relations. He made the claim that contrary to popular belief more than 50% of the world's rubber supply is now produced on small individually owned farms of less than 100 acres each.

In the development of rubber production in Latin America, Mr. Klippert states, small plantings will undoubtedly play an important role. While government agencies and private corporations have already made large plantings in several countries in Central and South America, the plan is to encourage local farmers to use these central plantations as sources of materials for their own plantings. In many areas, this adjacent expansion will contribute a major portion to the total rubber production.

The Goodyear Rubber Plantation Company, aware of the ultimate place of the native land holders in rubber production in Latin America, has for several years tested small-unit rubber production on its Speedway Estate at Cairo, Costa Rica, using simple, inexpensive equipment of the sort available to almost any farmer in tropical America. This equipment consists of such materials as discarded kerosene cans and oil drums, bits of scrap metal, hand-made wooden paddles and smokehouses of rough materials of local origin. Experience has shown convincingly that crude rubber of top quality can be produced in this manner with an investment in equipment of no more than perhaps $50, and in some cases much less.

In the establishment and maintenance of rubber trees, large, company-financed plantations have been regarded as more economically feasible than small ones financed by the average family. This is because, once the trees are planted, from 5 to 8 years must elapse before they may be tapped and cash returns begin. Such a prolonged waiting period would seem to limit the enterprise to operators of substantial resources. In the Far East, however, it has been found that this apparent advantage is overcome by making double use of the land on small farms—reserving part of the land for food crops, or interplanting the rubber trees with root crops, bananas, cacao, coffee, rice or other crops. These other crops supply both subsistence and a cash income for the grower while he is waiting for his rubber trees to mature. The interplanting is, moreover, a conservation measure, since it provides a ground covering that reduces erosion of the soil between the rubber trees.

According to a report from Tegucigalpa, the Honduran congress has approved a contract with the Firestone Tire & Rubber Co. for the cultivation of rubber in Honduras. No details as to the amount of acreage to be put under cultivation were received.

Revised Guayule Bill Provides for Planting in Western Hemisphere

The bill designed to give the Secretary of Agriculture authority to lease up to 75,000 acres of land to grow guayule and other rubber-bearing plants has finally become law. Originally passed and approved by both houses of congress early in February the bill was vetoed by President Roosevelt on February 17 because of a House amendment limiting production of guayule to the United States. Because of the "good neighbor" policy, the President believed that the bill should permit such production anywhere in the Western Hemisphere.

Senator Downey, of California, sponsor of the bill in the Senate, immediately sought to push through a revised bill in that chamber and the revised bill permitting the planting of guayule in any part of the Western Hemisphere in the interests of economy and defense was approved by that body on February 19. It was approved by the House of Representatives on February 28 and was signed by President Roosevelt on March 5. Like the original bill, it provides for the purchase of certain properties of the Intercontinental Rubber Co. at a cost not to exceed $2,000,000.

(Editor's Note: It has since been learned that an agreement has been reached for the purchase of Intercontinental's properties at a cost of $1,721,-235).

The Department of Agriculture has already swung into action on guayule development in accordance with the terms of the new bill. Under direction of Major Evan W. Kelley, the Forest Service of the Department has taken preliminary steps for the immediate planting of 700 acres of nursery and 2,000 acres of field plants in Salinas, Calif. A contract has been let for the construction of a seed house and workers are laying 1,000 miles of duck board to make the seed beds accessible to machinery. An overhead sprinkler system will also be built. Fifty foresters are in charge of operations.

According to present plans, 150 test planting plots of one acre each will be set out in various sections of California, Texas, Arizona and New Mexico. After results from these test plantings are correlated extraction plants will be constructed, land leased and large scale plantings undertaken. To commemorate the passing of the bill, Governor Culbert Olson of California officially proclaimed March 5 as Guayule Rubber Day and the fields and mills in Salinas Valley were thrown open to the public for inspection.

William O'Neil, president of the General Tire & Rubber Co., is continuing his campaign for a one-year harvest of guayule, but insofar as can be determined the Department of Agriculture plans to go through with its program for planting guayule seed under a four-year cycle arrangement. The one-year method results in a yield of approximately 1,000 pounds per acre but, since guayule produces seed at the rate of about ten to one in the first year harvesting in this manner would provide thousands of extra seeds. The four-year cycle results in yields of approximately 1,800 pounds per acre. Dr. David Spence, noted technologist and guayule expert, is also said to approve the one-year harvest plan.

Rationing of Retreads and Retreading Instituted by the O.P.A.

As indicated in a late news flash in the previous issue, nation-wide rationing of retreaded and recapped tires, and the process of retreading and recapping, was announced by Leon Henderson, head of the Office of Price Administration, on February 11. Issued as an amendment to the original regulations on the sale of new tires and tubes, the new order was to have become effective on February 19 but was later extended four days to February 23.

Under the new regulations the rationing of new tires and tubes, retreads, and retreading and recapping operations will be handled by the boards originally set up throughout the country. Tires of all kinds, including passenger car, truck, bus, farm implement, road-grading equipment, and motorcycle, are subject to the new rationing regulations.

Contains Two Eligibility Lists

The new ration order contains two eligibility lists, designated as A and B. List A, except for the addition of clergymen, is practically the same as that originally provided in the regulation order for new tires and tubes. List B is an addition confined exclusively to vehicles eligible to apply for certificates for retreaded and recapped tires. It includes licensed jitneys, taxis, and vehicles used for the transportation of various specially designated workers, executives, engineers, salesmen, etc.

Camelback, too, under the terms of the new rationing order, will be rationed by the existing community boards. The amount, grade and type of camelback manufactured is determined monthly by the War Production Board, and while a certain amount will be made each month to permit the retreading or recapping of truck tires, none was made available to the retreading industry for retreading or recapping passenger car tires in either February or March. Small quantities for such purposes, however, will be made available in subsequent months.

In issuing the new regulations, Mr. Henderson stressed the point that List B vehicle truck-tire certificates will be issued only during the last several days of each month and then only if any retreads are left over after the demands of List A truck eligibles have been satisfied. The eligible classes in List B are not automatically qualified to purchase retreaded or recapped tires, the regulations requiring anyone on that list to establish to the satisfaction of the local rationing board that his car is used exclusively on service essential to the community and to the nation. Trucks used for any important purpose not included in List A will also be eligible for retreads, at the discretion of the local rationing board.

Taking into consideration the fact that many manufacturers of camelback operate retreading facilities as part of their business, the regulations provide that no camelback maker can use monthly in his own or controlled retreading facilities a percentage of camelback greater than the percentage produced by him and so used during the year of 1941. This prohibition was included to insure that a substantial portion of the camelback which the W.P.B. permits to be produced will be made available for sale to independent retreading establishments who otherwise might not be able to replenish their stocks.

The regulations also provide that every establishment having truck tire molds will be given an initial allotment of truck tire camelback sufficient to bring the total truck tire camelback in his possession to 750 pounds per truck mold. Those already possessing more than 750 pounds per truck tire mold will not be given any additional camelback and, conversely, those with no inventory will receive the full amount. Applications for the initial allotment of camelback were supposed to be filed by retreaders with local rationing boards on special forms provided for this purpose. Purchases of camelback to make up the allotments must be completed by May 1.

The former broad provisions regarding the purchase of so-called "obsolete" tires for passenger cars, which in general applied to tires for cars more than ten years old, have been replaced in the new order with one prohibiting the sale of such tires except to passenger cars on either List A or B. As is the case with new tires, purchase certificates for retreaded tires or for retreading are good for thirty days only and may be exercised anywhere. The same certificate permits the holder to buy a retread or have a worn tire retreaded. No truck, bus or other heavy vehicle will be able to secure a new tire purchase certificate unless the local rationing board is first satisfied that the tire to be replaced cannot be retreaded.

In issuing the revised regulations, Mr. Henderson stressed the point that the sale of camelback to retreaders would continue as heretofore, but in the event retreading establishments holding "replenishment" certificates were unable at any time to obtain their fair share of available camelback it might be necessary for the O.P.A. to institute compulsory allocation of this material. He also stated that supplies of camelback and retreaded and recapped tires, as well as new tires and tubes, may be sold "upstream," that is, back to the supplier, without restrictions of any kind.

March Quotas Announced

Tire and tube quotas for March, substantially larger than those provided for rationing to eligible vehicles in the preceding month, reflecting subsidence of severe winter weather, were announced by Price Administrator Henderson on February 26. The March quota provides a total of 104,701 new tires and 87,635 new tubes for List A passenger cars, light trucks and motorcycles, which compares with 80,784 new tires and 67,616 new tubes for these vehicles in February, and 114,191 new tires and 95,580 new tubes for January, the first month of tire rationing.

The March quota for List A trucks, buses, farm equipment, and other heavy vehicles total 256,385 new tires and 288,149 new tubes, against 156,029 and 267,562, respectively, in February, and 242,783 and 202,956, respectively, in January. Retreaded and recapped tires available for rationing in March to heavy vehicles aggregate 110,225 units. Since rationing of truck retreads did not begin until late in February no comparisons can be drawn. Because the W. P.B. did not authorize the production of passenger car camelback in March no retreaded passenger car tires will be available for that month.

State and national reserves have been deducted from the published quotas for March in the same manner as in the two preceding months. The national reserve is, in effect, a pool that permits the O.P.A. to make adjustments between states and territories, while the state reserves are used for the same purpose among counties at the discretion of the state rationing administrators. On February 28 Mr. Henderson announced that since it first began the rationing of tires and tubes on January 5, 1942, the O.P.A. gradually has been revising the basis on which quotas are allotted to counties. Surveys are now being conducted to enable that organization to anticipate local needs and set quotas accordingly, rather than depending completely on automobile and truck registration figures and retail sales for each county.

Complete Tire Return Plan

Completion of a plan by which tire dealers and jobbers can dispose of their stocks of new passenger car tires and tubes, thus getting relief from the financial burden of carrying such stocks during a period in which they can make few sales, was announced by the O.P.A. on February 27. Provisions of the plan include the following:

1. Dealers and jobbers can sell to the original manufacturers or mass distributors as large a proportion as they wish of their passenger tire and tube stocks at their cost prices plus 10 percent for out-of-pocket expenses incurred in carrying this merchandise since tire and tube sales were stopped.

2. Manufacturers and mass distributors are required under the agreement to which they are parties to buy all such tires and tubes offered them by jobbers and dealers at the latter's costs plus 10 percent. Special provisions are made for purchasing back, at somewhat lower prices, "discontinued" lines of tires manufactured subsequent to December 31, 1937.

3. Manufacturers and mass distributors are required to sell such repurchased new passenger tires and tubes to

the Defense Supplies Corporation at the cost to the manufacturers and mass distributors of such repurchased tires, including the freight from the dealer's store to the manufacturer's or mass distributors warehouse to which the tires or tubes have been shipped.

4. Likewise, manufacturer's and mass distributors will be required to sell to the Defense Supplies Corporation their own inventories of passenger car tires and tubes, excepting small working stocks which they will be permitted to retain to fulfill orders received in the near future under the rationing plan, at the cost of such merchandise to them. They will have the option of repurchasing tires from the Defense Supplies Corporation. Furthermore, they will be required to make such purchases from the Defense Supplies Corporation in order to fill lawful demands for tires from holders of rationing certificates. The Defense Supplies Corporation is prepared to handle as much as $75,000,000 worth of passenger car tires and tubes under the plan.

The "Tire Return Plan" provides a means of financial relief for the tire dealer and jobber, concentrates initial control of nearly all new passenger car tires and tubes in the government, and provides financial assistance for small manufacturers who are not able to carry either their own inventories or the tires which they repurchase. It will require a small upward revision of the ceiling prices now in effect on wholesale and retail sales of new passenger car tires and tubes.

Before this plan was announced by the O.P.A. there was talk of declaring a moratorium upon the bank loans, business debts and Federal taxes owed by tire dealers and similar individuals or organizations whose income has been cut off by stoppage of sale of the products they normally handle. Such a moratorium was described as dangerous and likely to dissipate assets to the detriment of both debtors and creditors, according to credit men in the New York area, many of whom have expressed saisfaction with the present program.

Other Decisions of Interest

A number of other important rulings and decisions concerning the tire and tube situation were announced in the past thirty days, among them being the following:

(1) Donald M. Nelson, chairman of the W.P.B., issued Supplementary Directive No. 1B which delegates to the O.P.A. the authority to ration retreaded or recapped tires and retreading or recapping materials at wholesale as well as retail levels. The order enables O.P.A. to regulate the flow of camelback at all sales levels.

(2) Industrial interests and truckers, and other civilian consumers engaged in work under contract for one or another of the military branches of the United States or on a military project, are not entitled to tire priority ratings and must apply to their local rationing boards, the O.P.A. ruled on February 27. Only those vehicles on which the Army or Navy directly purchases tires are entitled to such rating.

(3) An owner of tires who was not a retailer, distributor or wholesaler on December 11, 1941, may transfer tires that were owned by him and were in his possession prior to that date from one to another of his own vehicles or from one place to another on his own premises, according to Amendment No. 7 to Supplementary Order No. M-15-c, issued by the O.P.A. on February 16. The amendment also narrows the restrictions applicable to tire warehousing, so that hereafter there may be unhindered transfer to warehouses provided no change in ownership takes place, although removal from warehouse remains subject to authorization by the O.P.A.

(4) Amendment No. 1 to the Revised Tire Rationing Regulations, issued by the O.P.A. on February 17, points out that although there are controls on physical movements of new tires, there are no restrictions on mere physical movement of retreads where change in title or use is not involved.

(5) Tire retreaders and recappers are permitted to purchase replacements for inner tubes used as a substitute for airbags in the retreading or recapping process, according to the provisions of Amendment No. 6 to Supplementary Order No. M-15-c, announced on February 12 by the O.P.A. Affidavits must be submitted to the effect that the tubes will be used solely for the purpose intended.

(6) Government-owned vehicles, except military equipment and certain other exempt categories, will be classified as either eligible or ineligible to obtain new tires from government supplies by the Treasury Procurement Division under a program announced jointly on February 20 by Price Administrator Henderson and Clifton E. Mack, director of the Procurement Division. The classification action will not affect the authority of local rationing boards, which continue to have ultimate decision as to eligibility of government cars or trucks for new tires.

One feature of the government program is the creation of a "fleet pool" of 2,000 new tires and 2,000 new tubes by the Treasury Procurement Division. This pool is intended to permit eligible government vehicles to replace blown tires, under emergency conditions, without any undue delay. The tires and tubes will be deducted from the national reserve and, accordingly, will not affect the monthly state and country tire quotas.

(7) Trucks used to carry beer from the brewery to the wholesaler or retailer are eligible for new tires under the rationing program, according to an O.P.A. decision. Beer is a finished product within the section of the regulation program covering such products.

(8) No one may bring new tires or tubes into the United States either for use or for resale except under the express authority of the O.P.A., according to a ruling contained in a letter sent on February 20 by Price Administrator Henderson to the Commissioner of Customs. Aside from this prohibition, however, the practice of bringing tires in from Mexico or Canada has been effectively stopped by stringent restrictions on tire exports put into effect by both these countries.

To Convert Jackson Plant

The Jackson, Mich., tire plant of the Goodyear Tire & Rubber Co., one of the most recent constructed and put into operation by the company, will be converted into a cannon factory, according to P. W. Litchfield, chairman of the board. The conversion plan was advanced to Army officials by Goodyear on its own initiative and received almost instant approval. As the new gun producing equipment is received the tire making machines will be removed and placed in storage for the duration of the war.

Abandon Carbon Black Plans

The project of building a carbon black plant near Orlando, Oklahoma, advanced by Charles Eneu Johnson & Co., of Philadelphia, manufacturer of Atlantic Carbon Black, as reported in our previous issue, has been abandoned, according to officials of that company. The petition made by the company to the Oklahoma State Corporation Commission to establish and operate the plant has been withdrawn.

New Substitute for Toluol

Notol No. 1, a hydrocarbon solvent, high in aromatics, has been introduced by the Neville Co., Pittsburgh, Penna., as a substitute for toluol. The nitrocellulose tolerance of the new material is within 80% that of toluol and hence it may be used with but slight change in formulation as an effective substitute. Although primarily recommended as a lacquer diluent for use in the lacquer industry under present wartime conditions, Notol No. 1 is also applicable for use in other industries.

Hold Aeronautic Meeting

Nine technical papers, including a symposium on production testing of engines, were scheduled for presentation at the National Aeronautic Meeting of the Society of Automotive Engineers, which was to have been held in New York City at the Hotel New Yorker on March 12 and 13. A paper on aircraft icing problems, by Willson H. Hunter of the B. F. Goodrich Co., was among those scheduled. Details of the meeting will appear in the next issue.

DISTRIBUTORS' TIRE STOCKS SHOW INCREASE AT YEAR-END

A slight increase in distributor's stocks of tires occurred during the final quarter of 1941, according to the latest survey of retail stocks of tires and tubes conducted by E. G. Holt, Chief of the Consumption Materials Unit of the Bureau of Foreign & Domestic Commerce, in his capacity of industrial consultant on rubber. Although such an increase is customary during the fourth quarter of the year, a decline has been considered likely because of events occurring at the year-end.

The bases and methods described in earlier reports were used in calculating stocks held by the following groups of distributors: (1) Individual dealers, including large and small retailers; (2) Distributors through oil-company chains of filling stations; (3) Manufacturer-owned-and-operated stores, mail-order houses, and other important retail chains.

The survey indicated that total stocks of casings increased from 6,478,000 last October 1 to 6,602,000 on January 1, 1942. Increases were general except for stocks in company-owned stores operated by tire manufacturers. Subtracting these stocks, the total for remaining distributors increased from 5,679,000 last October to 6,012,000 on January 1. As of January 1, there were 3,182,000 casings in the hands of individual dealers, 1,440,000 in oil-company chains, and 1,980,000 in all other outlets.

Sales of casings to consumers during the fourth quarter of 1941 are calculated at 6,865,000, compared with 7,663,000 during the final quarter of 1940, a decline of 10%. Consumer buying in the second and third quarters of 1941 set a new high record of 26,327,000 casings, an increase of 24% over the same period of 1940. The 1941 total of 39,417,000 casings sold was 12% above 1940.

Stocks of inner tubes in the hands of distributors on January 1, 1942, were almost identical with their holdings two years earlier and slightly higher than on January 1, 1941. An increase over the October, 1941, stocks were reported by all classes of distributors except the company-owned stores. The figures show total stocks of 6,512,000 inner tubes in the hands of distributors on January 1, 1942, held as follows: dealers, 3,374,000; oil companies, 1,205,000; all other, 1,933,000.

Ell-Tex Co. in Receivership

Raymond H. Cohn, of the law firm of Kussy, Cohn & Kohn, 790 Broad St., Newark, N. J., was appointed receiver for the Ell-Tex Co. of America, 39 Central Ave., East Newark, N. J., on January 24. The Ell-Tex Company, of which Alvin Meyer was president and Elliot Meyer sales manager, was organized in 1940 for the production of latex household gloves.

Coming Events

Mar. 17-18. National Ass'n of Waste Material Dealers, Hotel Astor, New York City.

Mar. 20. New York Rubber Group, Building Trades Club, N. Y. C.

Mar. 20. Rhode Island Rubber Club, Narragansett Hotel, Providence, R. I.

Mar. 20. Akron Rubber Group, City Club, Akron, Ohio.

Mar. 23-25. A.S.M.E., Spring Meeting, Houston, Texas.

Apr. 7. Los Angeles Rubber Group, Hotel Mayfair, Los Angeles, Cal.

Apr. 10. Boston Rubber Group, University Club, Boston.

Apr. 20-24. 103rd Meeting, A.C.S. Memphis, Tenn. (Note: The Division of Rubber Chemistry will not meet in Memphis. The next meeting of the Division will be held in Buffalo next September).

May 1. Joint Meeting of Buffalo and Canadian Rubber Groups, Niagara Falls, Ontario, Canada.

May 2. Chicago Rubber Group, Congress Hotel, Chicago, Ill.

May 11-13. American Institute of Chemical Engineers, Boston, Mass.

Sept. 7-11. 104th Meeting, A.C.S., Buffalo, N. Y. Rubber Division Headquarters: Hotel Lafayette.

Nov. 17-22. Second National Chemical Exposition, Stevens Hotel, Chicago, Ill.

Expand Solvents Production

A new unit for the manufacture of rubber solvents and plasticizers, sold under the trade names of "Tarol" and "Solvenol," is being constructed at the Brunswick, Georgia, naval stores plant of the Hercules Powder Co., according to an announcement by the company. In addition, existing equipment used in the production of other naval stores products is being converted to manufacture these materials in anticipation of greater demand for solvents and plasticizers from the rubber industry, especially from reclaimers of rubber. "Tarol" particularly supplies the strong solvent and plasticizing action required in the reclaiming process.

I.R.R.C. Bulletin Discontinued

Owing to the impossibility of giving various key statistics, the International Rubber Regulation Committee, which has its headquarters in London, has decided to discontinue publication of its monthly statistical bulletin. Publication will be resumed as soon as possible. The December, 1941, issue was the last one to be published.

1942 ESSAY CONTEST RULES ISSUED BY NEW YORK GROUP

Rules for the 1942 Prize Essay Contest, sponsored annually by the New York Group, Rubber Division, A.C.S., follow herewith:

(1) Contestants must be under 35 years of age and be paid-up members of the New York Group. Annual dues are $1.00, payable to Peter P. Pinto, Secretary-Treasurer, c/o *Rubber Age*, 250 West 57th Street, New York City.

(2) Subject Matter: Papers should be of a technical nature relating to any raw materials or processes concerned with the manufacture of rubber products. Papers may be the result of original work, development results, or interpretive results and reviews of rubber literature.

(3) All papers must be submitted in *triplicate*, with the author's name *omitted*. Attach name and address of the author separately to each copy. Each paper will be coded or otherwise numbered so that the judges cannot identify the author. All entries must be typewritten on 8½ x 11 inch paper, double spaced. In general, papers should conform in style to papers published in "Industrial & Engineering Chemistry," *i.e.*, they shall contain the following essentials: Abstract; Aim or Purpose; Body of Paper; Summary; Bibliography. This form is suggested only and need not be followed exactly to qualify.

(4) Papers submitted will become the property of the New York Group and their publication in the trade press will be at the discretion and by the selection of the Group's Executive Committee.

(5) Prizes: The Contest Committee will select the three papers deemed best in its judgment, and prizes totalling at least $100 will be distributed to the winners in the order of their value as decided by that Committee.

(6) All entries must be received not later than Wednesday, September 9, 1942. All those planning to submit papers shall indicate their intention and submit titles on or before August 19, 1942. Such advance notice and the papers themselves should be sent to Fred E. Traflet, Chairman, c/o Pequanoc Rubber Co., Butler, N. J.

Copies of the rules, suitable for use on bulletin boards, may be secured by addressing a request to the secretary of the group.

Sells Brake Lining Division

The Union Asbestos & Rubber Co., which maintains headquarters in Chicago and a factory in Cicero, Ill., has sold its brake lining division to the L. J. Miley Co., also of Chicago. The sale included equipment, stocks and work in process. Union Asbestos, according to J. H. Balch, secretary, will continue to produce non-automotive products, many of which are required in the war effort and some of which use rubber in their construction.

LOS ANGELES RUBBER GROUP SEES PICTURE ON PLASTICS

Approximately 115 members and guests attended the monthly supper meeting of the Los Angeles Group, Rubber Division, A.C.S., held at the Mayfair Hotel in Los Angeles on March 3. The program included a sound film on plastics and a learned historical discourse on the various flags that have floated over California.

The picture was presented by M. A. Collins, manager of the Plastic Industries Technical Institute of Los Angeles, and the talk on flags was given by R. A. Goodcell, manager of the Review Department of the Automobile Club of Southern California. Mr. Goodcell showed twelve different flags, the recital in connection with them giving a complete history of the area over a period of four hundred and more years.

The door prize, a $25 U. S. defense bond, was donated by the group itself. The Williams-Clarke Company, through Jim Clarke, customs brokers at Wilmington, California, donated six fine billfolds as special prizes. The Johnson Steel and Wire Company, through Charles Kipple and Joe Fiondella, donated fish-hooks as table favors. The Stauffer Chemical Company, through Claude Kelly, furnished cigars.

The door prize was won by Charles Parrish of the U. S. Rubber Company. The special prizes were won by Jess Bass of the Harvard Tire Company, H. L. Oak of the United Color and Pigment Company, Chuck Lamb of Bettis Rubber Company, Ltd., Art Wolff of the New Jersey Zinc Company, Bob Wade of the Los Angeles Standard Rubber Company, and Vic Vodra of R. T. Vanderbilt Co.

An expression was asked as to the will of the members on a summer event as some feel that a fishing trip under war conditions is not advisable. A report will be made on this at the next meeting which will be held in the same hotel on Tuesday evening, April 7.

New members approved by the membership committee and reported upon at the March meeting included Andrew T. Anderson of the Commercial Rubber Company, Frank Fenton of the W. J. Voit Corporation, Russell Hull of the U. S. Rubber Company, Charles H. Kuhn of the L. A. Standard Rubber Company, Virgil I. Lacy of the J. R. Gardner Company, Ira Vick of the U. S. Rubber Company, and Frank W. Steere of the B. F. Goodrich Company.

John Hoerger (A. Schrader's Son) gave a ten minute review of current events with comment pertinent to the interest of the group. C. J. Roese is program chairman and looked after details. The matter of naming a representative of the group to contact the government agencies on priority ratings, etc., was discussed by E. H. Lewis of the Western Insulated Wire Company. A report will be given on this matter at the next meeting.

Program for N. Y. Group Meeting

The New York Group, Rubber Division, A.C.S., has completed the program for its Spring Meeting, to be held on Friday, March 20, at the Building Trades Club, 2 Park Ave., in New York City. The meeting will get under way promptly at 4:00 P.M. and will be followed by dinner. The program includes two technical talks, one on the "Position of Reclaimed Rubber in a War Economy," by Dr. P.M. Elliott of the Naugatuck Chemical Division of U.S. Rubber, and the other on "Fundamental Aspects of the Synthetic Rubber Problem," by Prof. H. Mark of the Polytechnic Institute of Brooklyn. Both talks will be accompanied by slides. In addition, after dinner, two sound movies, "American Sea Power" and "Eyes of the Navy", will be shown through the cooperation of the U.S. Navy. Tickets for the dinner are $2.00 each and should be secured in advance from the secretary-treasurer of the group, Peter P. Pinto, c/o *Rubber Age*, 250 West 57th St., New York City.

Detroit Group Holds Meeting

A meeting of the Detroit Rubber and Plastics Group was held on February 27 at the Hotel Detroit Leland in Detroit, Mich. A paper on "Rubber and Plastics in the Aircraft Industry," delivered by George DeBell formerly of the Glenn L. Martin Co., makers of the famed Martin bomber, was the highlight of the evening. Mr. DeBell enumerated the various rubber and plastic products now entering the manufacture of various aircraft and discussed some developments occurring in these products. His paper was well received.

R. I. Club Meets March 20

The next meeting of the Rhode Island Rubber Club will be held on Friday, March 20, at the Narragansett Hotel in Providence. Alfred C. Neal, of the Economics Department of Brown University, will speak on "The Economic Impact of the War and the Post-War Outlook." The meeting starts at 6:30 P.M.

AUTO-RAILER HITS 60 M.P.H. ON HIGHWAY OR ON RAILROAD TRACK

The Auto-Railer, a speedy motorized vehicle designed and manufactured by the Evans Products Co., Detroit, Mich., which rolls on rubber tires on the highway or railroad track, is being used to eliminate some of the hazards involved in the movement of explosives at arsenals and powder depots. The vehicle employs special tires developed by the B. F. Goodrich Co. which work in conjunction with conventional flanged guide wheels for operation on railroad tracks. Tests indicate that the tires result in six times greater tractive power than the steel rail wheels alone. The Auto-Railer has a top speed forward or reverse of 60 m.p.h., either on highway or rail, and can be stopped as quickly on the rail as a modern automobile. On the rails, the tires bear a portion of the load normally carried entirely by the flanged rail wheels. In the photograph above, E. F. Tomlinson, left, manager of the War Products Department of Goodrich, and Howard W. Smith, of Evans Products, are shown inspecting the novel wheel assembly.

NAMES IN THE NEWS

COL. J. L. COCHRUN, vice-president and sales manager of the Seiberling Rubber Co., has been appointed field commander of the civilian defense forces of Summit County, Ohio. He will take complete charge of defense activities in the event of any emergency. COL. COCHRUN is a West Point graduate and served as chief of staff of the Second Army with the A.E.F. in France in 1918.

HARRY W. HICKS, who has been associated with the Holland-Rantos Co., Inc., New York City, for the past six years, recently as sales manager, has been appointed general manager of that company.

H. L. RIDDLE, assistant comptroller of Goodyear Foreign Operations and manager of the comptroller's foreign department, has been promoted to the position of assistant treasurer of the Goodyear Aircraft Corp. He has been with Goodyear since 1928.

ELMER T. CAMPBELL, associated with Goodrich in various sales capacities since 1921, has been transferred to the Washington, D. C., offices of the company's national sales and service division.

F. D. ASCOLI, a director of Dunlop Malayan Estates, a subsidiary of the Dunlop Rubber Co., widely known in rubber cultivation circles, has been named Rubber Controller for England. He is assisted by a Rubber Control Board, which acts in an advisory capacity.

RAYMOND G. FIRESTONE, president of the Firestone Tire & Rubber Co. of Tennessee, has been called for active duty by the Army. He was to have reported on March 13. MR. FIRESTONE holds a second lieutenant's commission.

CLARENCE O. BELL, flying sales engineer for Goodyear since 1929, has been appointed manager of the company's airplane division of its aeronautic sales department.

D. F. "DON" CLASH, widely known in eastern rubber manufacturing circles, is now with the General Cable Corporation as plant superintendent of the Emeryville, California, factory. He was associated with the Acorn Insulated Wire Co. for many years.

ALFRED O. REDLER, treasurer of the Vulcanized Rubber Co. which maintains offices in New York City and operates a plant in Morrisville, Penna., has also been named as vice-president in charge of manufacturing.

ARTHUR B. ASH, associated with the Mishawaka, Indiana, plant of the U. S. Rubber Co. for the past few years, has resigned that position to join the Michigan Alkali Co., Wyandotte, Mich., as a member of the research department.

JOHN J. LINKER, formerly chief engineer of the Flintkote Corp., is now associated with the Crane Packing Co., Chicago, in a similar capacity.

C. W. FLEETWOOD, affiliated with the Indianapolis, Ind., plant of the U. S. Rubber Co. for the past four years as a research chemist, has been transferred to the ordnance plant being operated by the company for the government at Des Moines, Iowa.

W. W. CRAWFORD, sales representative of the Columbia Chemical Division of the Pittsburgh Plate Glass Co., New York City, has been called for active duty and is now associated with the Commodities Division, Resources Branch, Office of Procurement and Material, Navy Department, Washington, D. C.

DAVID FEINBURG, head of the David Feinburg Co., scrap rubber dealers of Medford, Mass., has been nominated as president of the National Association of Waste Material Dealers, Inc. Nomination to an office in this organization is tantamount to election.

JAMES H. CONNORS, who recently resigned from the B. F. Goodrich Co., where he had been vice-president in charge of the mechanical goods division since 1931, was paid one of the finest tributes ever bestowed by the rubber industry when he was presented with a scroll and a $1,000 Defense Bond by a delegation representing the entire rubber industry on February 14. The scroll was signed by executives of practically all rubber companies in the United States.

GEORGE A. FOWLES has been appointed a sales engineer in the synthetic sales division of the B. F. Goodrich Co., with cable and wire insulation problems as his special field. A graduate of M.I.T., he has recently been connected with various utility companies and at one time was connected with the Anaconda Wire & Cable Co. at Pawtucket, R. I.

WALTER J. GELDARD has been transferred from the Naugatuck, Conn., plant of Naugatuck Chemical to the New York office where he will act as assistant to DR. W. F. TULEY, sales manager of chemicals and reclaim.

ROBERT J. EARL, formerly vice-president of the Voorhees Rubber Mfg. Co., New York City, has been elected president and treasurer, succeeding the late WILLIAM J. TOMPKINS. HERBERT S. MAY has been elected vice-president and secretary, and JOHN J. O'HARE, vice-president and factory manager. The company is now producing some of its own rubber flooring at a plant in Wilton, Conn.

SELDON W. ANDERSON, head of the Anderson Rubber Co., has been elected president of the board of directors of Children's Hospital of Akron, succeeding LEONARD K. FIRESTONE, president of the Firestone Aviation Corp., who has entered the Navy.

JOHN L. COLLYER, president of the B. F. Goodrich Co., and CYRUS S. CHING, director of industrial and public relations of the U. S. Rubber Co., have both been named members of the Business Advisory Council for 1942. The council, organized in 1933, acts as an advisory body to the Secretary of Commerce. MR. COLLYER has also been named as a member of the steering committee of the new war production group of the National Association of Manufacturers. This group will work in cooperation with DONALD NELSON, head of the War Production Board.

OSBORNE BEZANSON, production manager of the Merrimac Division of the Monsanto Chemical Co., has been transferred to the St. Louis offices where he has been assigned to executive supervision of the executive committee established by the company to manage the two government-owned plants being constructed by the firm, one a T.N.T. plant at Karnack, Texas, and the other for the manufacture of synthetic rubber chemicals at Texas City, Texas.

JEROME L. BOYER, a member of the technical staff of Newport Industries, Inc., and associated companies since 1929, has been appointed director of technical sales of that company. He is a graduate of the Massachusetts Institue of Technology, class of 1922.

PAUL D. BOWERS, chief chemist of the Firestone Tire & Rubber Co. of Tennessee, will act as vice-chairman of the 103rd Meeting of the American Chemical Society, which will be held in Memphis the week of April 20.

DR. ROYCE J. NOBLE, consulting technologist and author of "Latex in Industry," will shortly enter the armed forces as a Major in the Chemical Warfare Service at Edgewood Arsenal, Maryland. DR. NOBLE is also vice-president of Latex Process, Inc.

R. E. CARTLIDGE, technical sales representative of the Midwest Rubber Reclaiming Co., addressed the Rotary Club of Rittman, Ohio, on February 19. He discussed the reclaimed rubber situation.

BUREAU OF STANDARDS WARNS ON "WILDCAT" RUBBER SCHEMES

With a view to safeguarding the interests of the government as well as the public, the National Bureau of Standards has issued a set of rules for determining the merits of proposals for growing, synthesizing or reclaiming rubber. These rules, intended to prevent the growth of "wildcat" schemes involving rubber, many of which have recently come to the fore as a result of the present situation, follow:

1. An explicit, written description of the process should be obtained, together with statement of the yield of rubber to be expected.

2. This description should be reviewed by a disinterested authority to determine whether or not it is consistent with known facts and accepted scientific principles.

3. If the process appears practical, it should be tested by having a competent laboratory repeat it independently of the inventor.

4. If the process yields rubber as claimed, samples should be tested to determine the quality and probable commercial value of the rubber.

5. If the foregoing laboratory tests are satisfactory, the process should be operated on several successively larger scales until a scale is reached in which the product is made in commercial quantities.

Changes at Manhattan Rubber

Several changes in the executive personnel of the Manhattan Rubber Manufacturing Division of Raybestos-Manhattan, Inc., Passaic, N. J., have recently occurred. F. L. Curtis, general manager of the division, has been made a vice-president of the parent concern. He is also treasurer. H. E. Smith, formerly assistant general manager of Manhattan Rubber, has been named general manager, to succeed Mr. Curtis. J. H. Matthews, formerly assistant factory manager, becomes assistant general manager, while W. L. White, director of laboratories, and H. Snyder, manager of the roll covering and tank lining departments, become assistant factory managers. H. H. Burrows has been appointed manager of the roll covering and tank lining departments and P. A. Cady will act as laboratory manager. All of these changes took place within the Manhattan Rubber Division.

Akron Meets on March 20

The Spring Meeting of the Akron Group, Rubber Division, A.C.S., will be held on Friday, March 20, at the City Club in Akron, Ohio. The program will be in the hands of the General Electric Co. and will include "Lamps in the Spectrum" and "Applications of Radiation from Filament and Gaseous Discharge Sources." W. J. Krantz is secretary-treasurer of the group.

Nazis Lack Rubber Chemicals

Examination of tires removed from recently captured German planes indicate that lack of proper rubber compounding ingredients is forcing the Nazis to use a product of very low quality, according to K. D. Smith, assistant to the vice-president in charge of production of the B. F. Goodrich Co. The Nazis, it seems, are running short of carbon black, age-resisters, and organic accelerators.

New Extenders and Substitutes

The American Resinous Chemicals Corporation, of Peabody, Mass., is continuing to develop new resin emulsions for use as extenders and complete substitutes for latex, some of which were discussed in our December, 1941, issue. The company now has nine emulsions applicable for extending latex and four intended to substitute for that material.

Included among extenders developed to date is Alkyd 17-A, a highly plasticized resin emulsion, which is permanently tacky, the principal use for which is as an extender for latex for adhesive purposes in ratios varying from 20 to 50%. When mixed with 40% latex, the resulting compound may be used for the impregnation of paper and paper board, and in the shoe industry for the manufacture of sock linings, counter dips, and other products.

Other emulsions of the Alkyd series, when mixed with latex, find use as stiffening agents, such as those used in processing felt hat bodies; for impregnations and coatings, as in the production of raincoat cloth; and as a bonding coat on rubber beneath lacquer top coats. The various emulsions give different penetrating action.

The latex substitute emulsions include Acryl 11 and Vinyl 12. The first of these, when mixed with Alkyd 18, gives flexible impregnation mixtures for paper which serve as complete substitutes for latex. Vinyl 12 finds similar uses as the Acryl 11 series, but yields less tacky films. Other latex substitutes developed by the company are Emulsion 58-8 and 58-8C, both of which can be used for the impregnation of paper and cloth in place of latex, the latter being more highly plasticized than the other.

A new handy means of selecting the best paint without detailed technical study of properties of all finishes that might be suitable for a given application is provided in the Valdura Paint Selector, recently issued by the American-Marietta Co., 43 East Ohio St., Chicago. Copies of the selector are available on request to the company.

RUBBER DIVISION, A.C.S., CALLS OFF MEMPHIS MEETING

The meeting of the Division of Rubber Chemistry, A.C.S., scheduled for next April in Memphis, Tennessee, in conjunction with the 103rd meeting of the parent society, has been cancelled by unanimous action of the Executive Committee. This action was taken after a survey of the principal laboratories in the industry disclosed the universal sentiment that the time and energy of all technical men within the industry should be directed unstintingly to the problems growing out of the present emergency.

The Executive Committee concurred in this sentiment and agreed that the interests of the war program would be served best if the Division deferred meeting until the Buffalo Convention next September. The 104th meeting of the parent society will be held in Buffalo the week of September 7. The Hotel Lafayette has already been selected as headquarters for the Rubber Division. A detailed announcement concerning the Buffalo meeting will be sent out in May.

C. W. Christensen, c/o Monsanto Chemical Co., Akron, Ohio, treasurer of the Division, has advised that he wishes to purchase copies of the January, 1941, issue of *Rubber Chemistry & Technology*, and that he will pay $1.00 for each copy of this issue when delivered in good condition to his office in Akron.

New Plant for Thiokol Latex

Two large sections of the former Murray Rubber Company plant in Trenton, N. J., have been purchased by the Thiokol Corporation for the production of special synthetic rubber latex which will be used by the rubber industry for war equipment. The company's office, laboratory and a pilot plant are already located in another section of the former Murray factory. According to J. W. Crosby, sales manager of the company, the 60,000 plane expansion program in the aviation industry and the use of new types of benzol-blend aviation fuels have created a vastly increased demand for Thiokol latex which is highly resistant to the benzol-type fuels which are expected to become standard for airplane use for the duration of the war. Production of other types of Thiokol continues on a large scale in the Midland, Mich., plant of the Dow Chemical Co.

Form Petroleum Chemicals, Inc.

The Continental Oil Co. and the Air Reduction Co. and the latter's affiliated organization, the U. S. Industrial Alcohol Co., have formed Petroleum Chemicals, Inc., a new company to develop the production of synthetic organic chemicals from petroleum. The new concern is owned 50% by Continental and 25% each by Air Reduction and U. S. Industrial Alcohol.

FINANCIAL NEWS

B. F. GOODRICH COMPANY NETS PROFIT OF $8,608,324

The B. F. Goodrich Company reports consolidated net profit of $8,608,324 for the year of 1941 after all charges, including a write-off of $983,052, representing all investments and accounts receivable in the Far East, provision for Federal income and excess profits taxes, and a $6,000,000 reserve for contingencies.

The profit, which is equal to $5.02 a share on 1,303,255 common shares after preferred dividend requirements, was the highest reported since 1927 when earnings amounted to $11,780,307. In 1940, Goodrich showed a profit of $6,121,357, or $3.11 per common share.

Consolidated net sales during 1941 amounted to $211,454,790, an increase of 45.5% over the $145,354,278 reported for the previous year. Provision for Federal income and excess profit taxes amounted to $10,810,000, which compares with $2,200,000 provided in the previous annual report.

Dayton Rubber Mfg. Co.

Year ended Oct. 31: Net profit of $710,291, after all charges including provisions of $426,543 for normal and excess profits taxes and $175,000 for contingencies, equal to $3.50 each on 176,671 common shares after preferred dividend requirements. This compares with $518,897, or $2.41 a share, in 1940, and $783,581, or $3.91 a share, in 1939. Net sales for the past fiscal year amounted to $11,748,727, an increase of 41% over the $8,334,053 reported for the previous year and 31% over the $8,973,712 reported for 1939.

General Cable Corporation

For 1941: Net profit of $3,937,921, after deduction of $742,268 loss on sale of excess properties and equipment and provision of $8,760,000 for Federal taxes, equal to $26.25 a share on the 7% preferred stock on which dividend arrears at the year-end amounted to $52 50 a share. This compares with $2,455,362, after tax provision of $1,155,000 and inventory reserve of $250,000, or $16.37 a share, reported for 1940.

Mohawk Rubber Company

For 1941: Net profit of $200,279, which is approximately three times the profit of $66,485 reported for the previous year. Mohawk had a profit of $301,782 in the year of 1939. Net sales during 1941 amounted to $3,641,994, an increase of 51% over those in the year before. Outstanding debentures during the year were reduced from $176,000 to $88,000.

Hewitt Rubber Corporation

For 1941: Net profit of $396,304 after provision of $1,070,000 for Federal income taxes and $200,000 set aside in a special reserve account for post war adjustments, equal to $2.35 per share on the 168,188 shares of capital stock outstanding. This compares with $280,701, or $1.68 per share, reported in the previous year. Sales in 1941 were double those of any previous year in the company's history.

Bolden Manufacturing Co.

For 1941: Net profit of $641,405, highest in the company's history, which compares with $373,127 reported for 1940. Net billing for 1941 amounted to $10,044,422, against $6,254,659, while total payroll was $2,292,234 and $1,673,458, respectively. Taxes in 1941 amounted to $1,103,264, compared with $281,070 in the previous year.

Flintkote Company

For 1941: Net income of $1,737,661, equal after preferred dividends to $2.34 each on 699,706 common shares, which compares with $1,436,550, or $2.10 a share, in the previous year. Net sales during 1941 amounted to $27,151,169, an increase of 36% over the $19,897,748 reported for 1940.

Monsanto Chemical Co.

For 1941: Net income of $6,817,159, equal to $4.90 a common share, which compares with $5,519,289, or $4.04 a share, in the previous year. Provision for income taxes amounted to $9,609,250 in 1941 against $3,508,370 in 1940. Sales increased 40% to $63,756,221 from $45,607,600 in 1940.

United Carbon Company

For 1941: Net income of $1,711,547, equal to $4.30 each on 397,885 shares, which compares with $1,336,331, or $3.36 a share, in 1940. Estimated state and Federal income and excess profits taxes amounted to $1,145,000 in 1941 as compared with $725,000 in the previous year.

Dewey & Almy Chemical Co.

For 1941: Net income of $757,845, equal to $2.57 a share on the common and Class B shares, which compares with $502,751, or $1.85 a share after preferred dividends, in 1940. The preferred stock of the company was retired during 1941.

Late News Flash

Just as this issue was going to press we received an announcement from W. S. Farish, president of the Standard Oil Co. of New Jersey, outlining the position of that company in the synthetic rubber program. The announcement included the following statements:

(1) Standard Oil arranged and signed patent agreements with the government last December covering all questions bearing on buna rubber. Basic buna rubber patents have been allowed 1% of the cost of the rubber or approximately 2½c on a $15.00 synthetic rubber tire.

(2) Standard Oil is offering to industry and the government royalty-free licenses for the manufacture of butyl rubber for the duration of the war; thereafter, it will be offered on reasonable royalties to be determined by government authorities.

(3) The company has undertaken to produce for the government and for the Canadian government a total of over 200,000 short tons annually of special synthetic rubber and raw materials for buna rubber and this operation should be in full swing by the middle of 1943.

(4) The investment required to produce buna rubber is $1,000 a ton of yearly capacity or $700,000,000 to $800,000,000 for the entire needs of the country, military and civilian. Production of buna rubber in large quantities should cost about 30c a pound.

Buffalo Group Hears Wiegand

W. B. Wiegand, director of research for the Columbian Carbon Co., was the principal speaker at a meeting of the Buffalo Group, Rubber Division, A.C.S., held at the Hotel Westbrook in Buffalo on February 27. He was ably assisted by William A. Ladd, physicist, also associated with Columbian Carbon. Messrs. Wiegand and Ladd delivered an illustrated talk on the electron microscope and the significance of its findings regarding colloidal carbon. A condensed version of this talk appears elsewhere in this issue. It was announced at the meeting, which was attended by approximately 50 members and guests, that the Buffalo Group had been invited to act as hosts to the Rubber Division at the Fall Meeting to be held in Buffalo next September. The invitation was unanimously approved and the banquet and entertainment will be arranged for by members of the group to be appointed at a later date.

NEWS IN BRIEF

U. S. Rubber has been awarded a contract by the War Department to operate a new plant for the manufacture of trinitrotoluene (TNT). The plant will be located somewhere in Pennsylvania and will be known as the Pennsylvania Ordnance Works. U. S. Rubber is also operating an ordnance plant in Des Moines, Iowa, for the manufacture of small arms ammunition.

The miscellaneous and varied products now being manufactured by the Goodyear Tire & Rubber Co. in the war effort are excellently portrayed and briefly described in a booklet entitled "A Report for 1941 to Goodyear Employees" which accompanied the company's recent annual statement for 1941.

A paint with a synthetic rubber base that resists acids, alkalies, fumes and water has been introduced by the Chemical Enamels Co. of Cleveland, Ohio. It may be used in the presence of strong organic acids or at temperatures above 260° F.

The bomb shelter constructed by the Firestone Tire & Rubber Co. was publicly opened on March 2 as an exhibit to acquaint people in the Akron area with what life is like under air raid conditions. The shelter is made of strong, heavy corrugated plates forming a gas and water-tight cylinder large enough to accommodate 50 people.

Seiberling Rubber Co., Akron, has made available an interesting little booklet written by J. P. Seiberling, president, under the title of "The Night is Dark; Let's Face It." The booklet carries a message to the company's dealers with suggestions for their conduct during the present emergency.

U. S. Rubber has launched a nationwide campaign through its dealer organization to help motorists double the life of their tires. The campaign is built around a 10-Point Car Owner's Creed, prepared by the company to assist the government in its rubber conservation program. Dealers will be provided with a Plan Book which will help them answer questions asked by motorists about the tire situation.

Monsanto Chemical Co. is sponsoring "Share-Your-Car" clubs in its 14 plants and 10 branch offices, the purpose being to pool transportation so that employee-owned cars will carry capacity loads and thus conserve tires. Each car operated by a member of the club will carry a sticker, furnished by the company, pledging the operator to carry fellow employees and friends whenever possible.

Common and safe weapons for fighting light magnesium incendiary bombs effectively are demonstrated in a new sound film, "Fighting the Fire Bomb," a training film approved by the Office of Civilian Defense. An Instructor's Manual is furnished for use by factory and other officials in connection with the showing of the film. Further details are available from the Safety Research Institute, 420 Lexington Ave., New York City.

A new booklet outlining the proper care and operation of farm tractor and implement tires has been issued by the Farm Service Bureau of the Firestone Tire & Rubber Co. The booklet is entitled "How to Get Maximum Performance and Longer Wear from Your Tractor and Implement Tires" and is available without charge on request.

The American Standards Association, 29 West 39th St., New York City, has announced the publication of its new list of American Standards for 1942. Approximately 500 standards are listed in a wide variety of industrial fields and in the fields of industrial and public safety. The list will be sent without cost on request.

Containing several sections devoted to the care and maintenance of tires, and thus the conservation of rubber, in addition to the usual contents of such publications, Goodrich has just published its 1942 Farm and Home Almanac and is distributing them free on request.

A clear, concise explanation of how the wartime program affects purchase, use and maintenance of temperature measuring and control instruments is given in Defense Bulletin No. 1, just issued by the Wheelco Instrument Co., Harrison and Peoria Streets, Chicago, manufacturers of pyrometers and other instruments. Copies are available on request.

LOS ANGELES NEWS

A letter from Gib Balasz who has been in England with the Goodyear Tire and Rubber Company for some years indicates that he may get back to the United States some of these days. His family has been back in America for some time. He highly compliments the British people on their ability "to take it" and "to give it".

F. H. Banbury, of Farrel-Birmingham, has been in southern California for some time. He attended the March meeting of the Los Angeles Rubber Group. When in the West he usually lives at the Mission Inn in Riverside, California.

More new presses have been added just recently by the Bettis Rubber Company, Ltd. The factory is now running 24 hours a day. About half the output is in defense material and half oil well equipment.

T. Kirk Hill spent half of February in Texas in connection with the affairs of the Arrowhead Rubber Company of Texas, located in Dallas. A number of new machines were installed during the month. About 55 employees are now on the list. The factory is turning out airplane products almost exclusively.

Frank Van Der Kar is the new assistant purchasing agent in the local plant of U. S. Rubber. Mr. Van Der Kar comes here from Eau Claire, Wisconsin, and prior to that he had been with the company in Detroit.

Both Jack Weimer, factory superintendent, and Frank Fenton, plant manager, of the W. J. Voit Corporation, spent two weeks at Wright Field in Cleveland, Ohio, in February and early March.

Bruce Atkinson, secretary to Frank Steele (general superintendent of the Goodyear plant in Los Angeles), is the father of a daughter already known as Linda Louise.

It has been announced that three Goodyear men in Singapore with a chance to get out in advance of the Jap invasion showed their mettle by sending their families out while they themselves joined the British army and helped with the resistance.

Joe Meek, who has been personnel and production superintendent for Firestone, has been transferred to Nebraska.

John Hoerger, local manager for A. Schrader's Son, is busy handing out a striking "Conserve Rubber" poster put out for free distribution by his company. "Not only is America waging war against brutal aggressors, but she is waging war against waste", says Mr. Hoerger, "and our company is trying to do its bit by offering this poster to any concern that wants it."

CANADIAN NEWS

Paralleling the huge synthetic rubber program recently announced for the United States, the Canadian government will embark on a similar although more modest venture, according to official statements made by Hon. C. D. Howe, Minister of Munitions.

The basic raw material plant will be located at Sarnia, Ontario, terminus of an oil pipe-line from the United States. Beyond this bare fact, little official information has been given out concerning this plan to supply Canada's wartime needs for rubber. Unofficially, it is understood that the Canadian program will cost an estimated $40,000,000 and that production will start in about eighteen months depending on the availability of equipment, which must come from the United States. Two other plants—probably for the polymerization of the raw materials—are said to be contemplated but their location has not been announced.

Semi-official word has been received of the formation of a Synthetic Rubber Advisory Committee which includes in its membership Dr. R. K. Stratford, Sarnia; Dr. D. M. Morrison, Montreal; Dr. W. A. Gibbons, Passaic, N. J., research director of U. S. Rubber Co., of which Canada's Dominion Rubber is a subsidiary; Dr. J. H. Boyd, Akron, assistant to the president of the Hycar Chemical Company; and J. R. Nicholson, Ottawa, Deputy Controller of Supplies of the Wartime Industries Control Board.

On the basis that it costs approximately $1,500,000 for plant capacity adequate to produce 1,000 tons of synthetic rubber it appears that contemplated Canadian production will be about 25,000 tons of rubber a year, an amount which is approximately half of normal demand.

Buna S, the same type of rubber to be produced in greatest quantity by the United States plants now under construction, will also be the product of the Canadian plants. Butadiene, principal raw material, will be obtained from the Sarnia plant. It is not known as yet where styrene, the other basic raw material, is to come from nor where the plants to polymerize these two raw materials into synthetic rubber will be placed.

Situation Considered "Grave"

The withdrawal from service of possibly one-third of Canada's 1,500,000 registered motor vehicles and the virtual elimination of all civilian pleasure driving before 1943 are being forecast as results of the desperate rubber shortage.

A. H. Williamson, Controller of Supplies, Wartime Industries Control Board, describes rubber as "the gravest problem confronting the United Nations" and adds that "the rubber shortage is so serious that our ability to fight an all-out war is imperilled". According to Mr. Williamson, there is no prospect of relief for the public until after the war. The ordinary car user, he states, will have to get along on his own tires and when these are worn out lay up his car for the duration. Mr. Williamson forecasts the prohibition of the sale of retread material except to essential users, discontinuance of non-essential bus service where other transportation is available, and elimination of long-distance trucking of goods where rail movement is possible.

Drastic Steps Contemplated

It is understood that other steps of an even more drastic nature are contemplated. Unofficially, the suggestion has been discussed that the government may eventually commandeer tires from all non-essential private motor cars or, at least, impound all spare tires from such vehicles in order to make these tires available to essential users.

Whether such drastic steps are taken or not, the inability to manufacture the 2,500,000 tires normally produced for civilian use will mean withdrawal of almost all non-essential cars from the highways in the next three years and a very large percentage within the next six months.

In the past no effort has been made to reclaim old rubber in Western Canada because the only reclamation plant was in the eastern provinces. Arrangements are now being made, however, to collect old tires and rubber in the prairies states and ship them to the nearest point in the United States for reclaiming.

The necessity of conserving rubber has also caused the Rubber Substitutes Advisory Committee to issue a list of articles which are considered non-essential. The list does not include all non-essential articles but only those so far ruled as such by the Rubber Controller. Manufacturers requiring rubber for other articles must make application to the committee telling the purpose for which the rubber is wanted. If the committee does not consider the article essential supplies of rubber will not be made available.

Personnel of the Rubber Substitutes Advisory Committee includes J. R. Nicholson, Deputy Controller, chairman; W. H. Funston, Jr., Hamilton, president of Canadian Firestone; P. C. Jones, Montreal, president of Dominion Rubber; A. G. Partridge, Toronto, president of Canadian Goodyear; and G. W. Sawin, Kitchener, president of Canadian Goodrich.

The articles so far listed as non-essential include

Rubber flooring; mats and matting of all types except switchboard matting certified for use in front of electric switchboards; matting or flooring for railway coaches, inside or out; car mats except for new automobiles;

Industrial solid type, small truck tires including molded-on and slip-on type; baby carriage tires, except for new carriages; carriage tires for horse drawn vehicles except new vehicles and where the controller gives special authorization; rubber covered horseshoes, calks, and horseshoe pads;

Quarter linings for shoes; cement for cold tape and "sock lining" used in shoe manufacture; cement for box toe manufacture; rubber for leather finish; stick-on soles; repair kits for mending shoes;

Wringer rolls for washing machines except for new machines based on the quota for new machines and for replacement—restricted to 50% of average monthly production in the base period;

Garden hose, except for industrial use in plants and by market gardeners and in greenhouses when certification is given that it will be used exclusively on the property;

Latex for the sealing of pile in upholstery except for new motor vehicles and railway cars; latex for making belts and handbags; latex for spraying backs of skins in manufacturing furs; latex for labelling paste except for use in labelling food tins for the British Ministry of Health; latex for artificial flowers or feathers;

Auto heater hose; rubber for manufacturing leather upholstery for trucks and passenger cars, either new or replacement; weatherstripping in any form; battery jars except for new vehicles and industrial use—replacement jars restricted to 50% of average monthly production in base period; billiard table rubber; bowling pin bands;

Rubber thread, except for trusses and surgical garments; elastic bands; toilet seats; rubber combs; ground sheets for civilian use; rubberized interlinings for cloth coats; cement for envelopes; pen and pencil barrels; replacement rubber for permanent waving machines; refrigerator rubber parts; and hat gum rubber.

Form Elastic Allocation Group

Formation of an Elastic Allocation Committee of the Wartime Prices and Trade Board has been announced by P. Horace Boivin, Director of Narrow Fabrics, Montreal. Purpose of the committee is to prorate existing stocks of elastic and Lastex fabrics among the various Canadian manufacturers. The committee includes: A. D. Starks, Hamilton Cotton Company, Ltd., chairman; A. G. McKinnon, Canadian Lastex, Ltd., Montreal; F. MacElwain, A. Stein and Co., Ltd., Toronto; K. W. Harvey, York Knitting Mills, Ltd., Toronto; A. Ferguson, Spencer Corsets, Ltd., Rock Island, Quebec; A. Zavalkoff, Dominion Gaiter Manufacturing Company, Montreal; and A. Rooke, H. W. Gossard Co., Ltd., Toronto.

OBITUARIES

P. D. Saylor

Parry D. Saylor, one of the founders and chairman of the board of Canada Dry Ginger Ale, Inc., who was associated with the rubber industry from 1910 to 1922, died on February 20 at his home in Litchfield, Conn., after an illness of four weeks. He was 63 years of age.

Born in Bloomfield, Ontario, Mr. Saylor was graduated from the New York Homeopathic Medical Hospital and for a few years practised as a licensed physician. Finding industry more to his liking, he joined the Goodyear plant in Toronto in 1910 as assistant sales manager in charge of mechanical goods and the following year was made sales manager of the Goodyear Tyre & Rubber Co. of Canada, Ltd.

In 1913 Mr. Saylor went to England in charge of the company's export office in London, remaining at that post until shortly after war broke out in 1914. During the war he served as a major on the General Staff of the Canadian Army and before the end of the war he was director of food distribution for the Canadian forces abroad.

At the end of the war Mr. Saylor returned to the United States where in 1920 he became vice-president and general manager of the Dunlop Tire & Rubber Corp., located in Buffalo. He served with Dunlop approximately three years, resigning sometime in 1922. He later organized Canada Dry, which is currently the largest manufacturer of ginger ale in the world. He leaves a widow, son and daughter.

Mark J. Gillen

Mark J. Gillen, who was associated with various rubber companies prior to the first world war, died of a heart attack in Los Angeles during the blackout that accompanied rumors of an air raid on that city on February 25. A resident of Akron for many years, Mr. Gillen had been associated with the old Diamond Rubber Co., Goodrich and Goodyear, and helped to organize the mechanical goods division of the Pennsylvania Rubber Co. at Jeannette, Penna. At one time he also served as president of the old Standard Tire Co., in Willoughby, Ohio. At the time of his death Mr. Gillen was manager of the Palos Verdes Estates, an exclusive residential development in Los Angeles.

Herbert Standring

Herbert Standring, founder of the *India-Rubber Journal* in 1884 and one of the founders of the Institution of the Rubber Industry in 1921, died at South Godstone, England, on January 8. More than 80 years old, he had spent close to 60 of those years in the rubber industry. At the turn of the century Mr. Standring sold the *India-Rubber Journal* to its present owners, Maclaren & Sons, but continued as editor for several years thereafter. Subsequently, he edited the *Rubber & Tyre Review* and the *Rubber Age (of London)*, severing his connection with the latter journal on his retirement a few years ago. His genial personality is said to have made him a popular figure throughout the British rubber industry.

James D. Tew, Jr.

James D. Tew, Jr., son of the former president of the B. F. Goodrich Co. and formerly connected with the staff of Carl Byoir & Associates, New York public relations house handling the Goodrich account, has been killed in action according to notification sent to his father by the British War Office. The younger Mr. Tew was a fighter pilot with the R.A.F. and when last heard from was in Malta. He attended Western Reserve Academy at Hudson, Ohio, was graduated from Salisbury School in Connecticut and later from Harvard. Before getting into public relations work he worked on several newspapers, including the *Japan Advertiser*.

Streamline Sales Organization

Due to the great importance of government and manufacturers' sales, the sales organization of the Seiberling Rubber Co. has been reorganized, according to the announcement by Col. J. L. Cochrun, vice-president in charge of sales. L. M. Seiberling, formerly commercial sales manager, has been named to the newly-created position of assistant sales manager in charge of government and manufacturers' sales; T. M. Hughes becomes commercial sales manager; C. A. Reed continues as assistant sales manager; William J. Ruscoe is in charge of mechanical goods sales; G. A. Wiedemer is service sales manager. A Washington sales office has been opened at 1147 Connecticut Avenue, in charge of J. F. Seiberling.

"Air Raid and Blackout Precautions for the Protection of Windows" is the title of a bulletin prepared by the Pittsburgh Plate Glass Co. for the benefit of its customers and friends. Copies are available without cost on request to any of the company's branch offices.

Washington Appointments

Dr. Ernest W. Reid, of Pittsburgh, Penna., has been named chief of the Chemicals Branch of the W.P.B., replacing Dr. Edward W. Weidlein who will be retained as senior consultant. Dr. Weidlein's efforts in recent months were devoted to the development of the synthetic rubber program and he will continue that responsibility for the Board's Material Division.

John S. Bartlett, formerly associated with Firestone, has been appointed chief of the rubber section of the O.P.A.'s Division of Accounting, Analysis and Review. Associated with Firestone as a staff accountant for 14 years, Mr. Bartlett has been with the War Department for the past two years.

A. L. Steele, manager of Goodyear's Retail Sales Division, has joined the Procurement Division of the Army Signal Corps as an industrial specialist. He will be located at Wright Field, Dayton, after a thorough training course.

Clifford C. McAleenan, formerly assistant sales manager of the Anaconda Wire & Cable Co., has been named as special assistant to Samuel S. Stratton, director of the technical consultant staff of the Division of Priorities of the W.P.B.

D. J. Hutchins, district sales representative for Firestone in the Detroit area, has joined the staff of the automotive branch of the Bureau of Industry Operations of the W.P.B.

Lt.-Col. Eaton Heads R.A.B.R.M.

Lt.-Col. B. J. Eaton, associated with the rubber industry for the past 30 years, has been appointed Secretary of the Research Association of British Rubber Manufacturers, Croydon, England. Born in Dorchester on December 20, 1883, Lt.-Col. Eaton received his education at the Dorchester Grammar School and Finsbury Technical College. He entered the rubber industry in 1906 in British Malaya as a government chemist for the F.M.S. and later served as agricultural chemist for both the F.M.S. and S.S. For a time he served as director of the Rubber Research Institute of Malaya, resigning from that post in 1936. Last year Lt.-Col. Eaton was awarded the Colwyn Gold Medal, one of England's highest honors, in recognition of his extensive work in the cultivation, collection and preparation of plantation rubber.

A booklet on "Safety Clothing for Women in Industry" has been prepared by the Women's Bureau of the U. S. Department of Labor. Copies are available from the Superintendent of Documents, Washington, D. C., for 10c each.

E. L. ANTONEN, vice-president of the Denman Tire & Rubber Co., Warren, Ohio, addressed the Cincinnati Chapter of the National Association of Cost Accountants on February 19. He spoke on the "Fundamentals of Standard Costs."

40% LATEX
60% LATEX
REVERTEX

73-75% CONCENTRATED

Compounds tailored to your special requirements

Technical Service is at your Disposal without charge or obligation

REVERTEX CORPORATION OF AMERICA

37-08 Northern Blvd., Long Island City, N. Y.

RANDALL & STICKNEY

Hand Grip Rubber Gauge No. 3-B

Height .....9"	Length .....9¾"	Range .....½"
Depth of Throat ....6½"	Dial 50 Divisions Each Div. 1/1000"	Weight .... 4 lbs. Frame . Aluminum

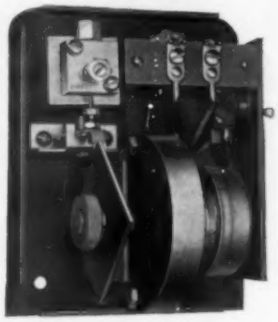
Designed for gauging stock as it is coming from the calender.

FRANK E. RANDALL, Waltham, Mass.

NEW EQUIPMENT

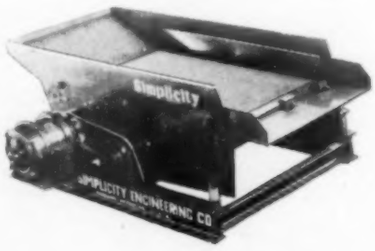
Taylor Repeating Cycle Timer

The periodic purging of condensate from certain types of curing or molding equipment is also beneficial in creating adequate heat distribution. Mechanical and thermostatical traps often fail to set up the steam circulation necessary. To effectively handle this purging, a Taylor Repeating Cycle Timer has been developed by the Taylor Instrument Companies, of Rochester, N. Y. This new unit, also known as the "Blow-Down Timer," is used in conjunction with a diaphragm motor—operated reverse acting condensate valve, and with suitable temperature or pressure control on the application, permits the admission of fresh steam without affecting an appreciable pressure change within the apparatus. The new Taylor instrument permits control of the duration as well as the period of the blow-down cycle.



Simplicity Gyrating Screens

For many years the Simplicity Engineering Co., of Durand, Mich., has been supplying gyrating screens for every type of operation requiring a separation into sizes, reclamation of products or dewatering of liquid pulps. Some of these machines are used in the rubber industry to dewater finely ground scrap rubber. These screens are in general use in screening operations ranging from 200 mesh separation up to screening large size material through 6 inch openings. They are said to operate under heat conditions as well as extremely cold, so that they are suitable for varying ranges of screen separation. Features pioneered and developed by the company over a period of years include solid counterbalanced shafts, resilient rubber mountings, screen cloth in four-way tension over a doubly-crowned deck surface, completely protected bearings, and others.



BAIRD

MANUFACTURERS' CRUDE RUBBER PURCHASE PERMITS

▲

• Our long experience since 1903, together with our friendly relations with our old and new customers ideally equips us for the prompt, efficient and thoroughly satisfactory handling of

Manufacturers' Crude Rubber Purchase Permits

• We shall continue to appreciate and respect the business of our old friends and assure the new ones that their orders will be handled with courtesy and efficiency . . . . . .

▲

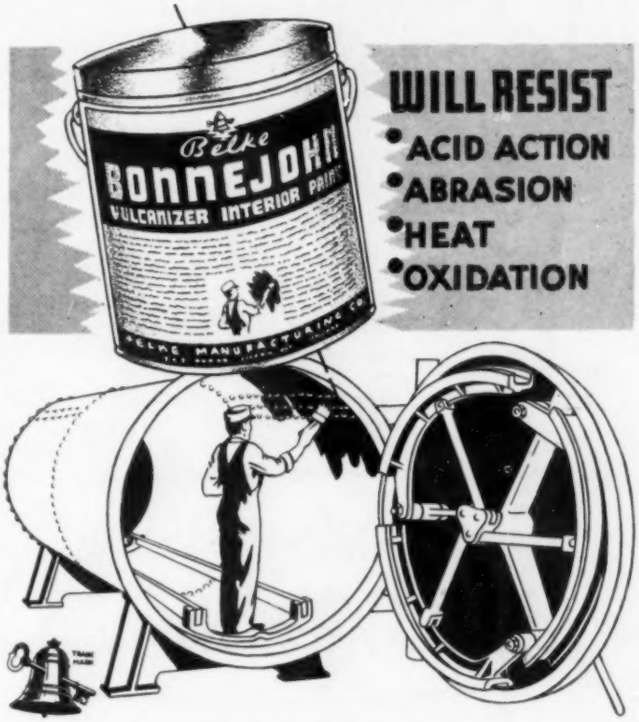
BAIRD RUBBER & TRADING CO., Inc.
WOOLWORTH BUILDING
233 Broadway New York

BArclay 7-1960

WILLIAM T. BAIRD, JR. COLLIER W. BAIRD
HAROLD W. HOLCOMBE DENIS P. MOCHARY

The Sensational New

VULCANIZER INTERIOR PAINT



WILL RESIST
- ACID ACTION
- ABRASION
- HEAT
- OXIDATION

SAVE YOUR VULCANIZERS with *Bonnejohn Vulcanizer Interior Paint* an insoluble coating that gives lasting protection to fittings and vulcanizer interior surfaces.

Its formula represents the results of scientific experiments and contains materials that minimize sulphurous fumes and acid action as well as being anti-corrosive under high steam pressure.

Can be applied with a brush, spreads easily, has exceptional long lasting and adhesive qualities, seals perfectly requiring no preliminary preparation other than having surfaces clean before painting.

Recommended for carts, hangers, and door mechanism or any equipment used in the interior of vulcanizers, or any place in your plant where equipment needs protection against extreme corrosion.

Comes in black only .....$9.75 per gallon.

BELKE MANUFACTURING CO.
947 N. CICERO AVE. CHICAGO

WILL THESE ADHESIVE, COATING AND IMPREGNATING ADVANTAGES HELP YOUR WAR PRODUCTION?

N SERIES (Neoprene Base) CEMENTS

- Oil and Chemical Resistant
- Sunlight and Air Resistant
- Non Thermoplastic
- Won't support Combustion
- Non Gelling — Longer Usability
- Paint, Spray or Dip Application
- Room Temperature Vulcanization

NEW UNION BAY STATE PROCESS EXTENDS LATEX 50% TO 300%!

Major characteristics of the original latex are retained as well as a good proportion of its natural strength—making the extended product adaptable to most cementing, coating and impregnating operations without appreciable loss of efficiency. Government allowed latex users are urged to investigate.

N Series (Neoprene Base) Cements are applicable to adhesive, coating and impregnating operations involving fabric, leather, rubber, synthetic rubber, wood, metal and various combinations of these materials — *each individual problem requiring its own specific N Series Formula.* Therefore, please include in your letter of inquiry complete information regarding the materials involved and the results desired, as well as your priority number. *Write today!*

Specialists in Neoprene, Latex, Rubber Adhesives and Coatings.

UNION BAY STATE Company

50 HARVARD STREET, CAMBRIDGE, MASS.

Consider these Important ORVUS ADVANTAGES

As a MOLD LUBRICANT

—Orvus permits articles to leave molds readily; molds clean easily.

—Orvus is effective in hardest water.

—Orvus forms no insoluble materials which might be deposited as a film on mold or rubber.

For WASHING and FINISHING

—Orvus cleans thoroughly such articles as inner tubes, automotive parts and other molded and extruded rubber goods. Leaves articles with a pleasing finish.

Write for further details about Orvus.

PROCTER & GAMBLE
CINCINNATI, OHIO

ORVUS*

*ORVUS is a sulfated alcohol type cleanser—not a soap.

Eastern Engineering Coolant Pump

The addition of a complete new series of coolant pumps to its present line of industrial and laboratory pumping equipment has been announced by the Eastern Engineering Co., 45 Fox St., New Haven, Conn. The new pumps feature an open impeller which allows

small chips or grit to pass through the pump without harming or affecting it in any way; no stuffing boxes to leak, consume power or require adjustment; compact design to enable installation and small space. No priming is required. Designed for use on lathes, shapers, milling, drilling and grinding machines, where a steady stream of coolant or cutting oil is necessary, the new pumps are also suitable for circulating non-viscous liquids for cooling and circulating applications. Most models in the new line come in two sizes—long and short. Model No. 17, illustrated in both sizes, has a maximum pressure of 6 lbs. per sq. in. and maximum capacity of 17 gallons per minute. Several other vertical and horizontal models, with varying pressure and capacity, are available.

Remote Valve Control Unit

A newly designed unit for the manual control of remote valves, dampers and other pneumatically operated equipment has been announced by the Foxboro Co., Foxboro, Mass. In appearance, the unit harmonizes with the rectangular case in which Foxboro recording and controlling instruments are now available. When the unit is flush-mounted, its front surface is only 7/16-inch from the surface of the instrument panel, and as its setting knob and pressure indicator are recessed, there are no protruding parts to suffer accidental bumps.

Specifically designed for dead-end service, the remote valve control unit will hold reduced pressures, dependably, to values within very narrow limits. Although most commonly used as its name suggests, it is equally useful in other applications, such as the setting of the control points of distant instruments or the adjustment of positioning or pressure-producing pistons, located in inaccessible points. It is practical for operation over distances as great as 1,000 feet.

Por-os-way Grinding Wheel

The Por-os-way Grinding Wheel, a new type of precision grinding wheel produced by a patented process, has been introduced by A. P. deSanno & Son, Inc., Phoenixville, Penna. As the name implies, the new

grinding wheel has a structure which instead of being "sandy" and compact is "stringy" and porous, somewhat resembling a sponge. Air cells allow the air to keep every grinding contact cool, but at the same time Por-os-way is hard, tough, holds the corner and requires very little dressing, due to a new vitrified bond. According to the manufacturers, the new wheel, properly used, takes deeper cuts, breezing through .010-inch or more, grinds 100 to 400% faster than similar wheels, and increases production per man per machine two to five times. It resists loading on hardened tool and die steels and on softer materials, such as rubber, aluminum, copper, plastics, brass and tin. Loading is said to be reduced to the minimum.

BRIEFS . . . . .

The development of a complete line of *"blackout and camouflage" paints* to meet the current war emergency has been announced by the Paint Division of the Pittsburgh Plate Glass Co., Pittsburgh, Penna. The paints are designed for domestic and commercial use in areas subject to possible air raids. They obscure illumination when applied to windows, skylights, and other glazed openings.

•

A new *safety transformer* designed to reduce fire, explosion and burn hazards has been developed by the Acme Electric & Mfg. Co., of Cuba, N. Y. It provides for two 32-volt a.c. extension lines to permit light for workmen who must perform their duties under conditions in which explosive gases or vapors exist.

•

A *luminous "blackout" paint,* which can be applied to objects of all kinds and renders them visible in the dark, has been developed by Maas & Waldstein Co., Newark, N. J. The paint owes its luminosity to a substance which re-radiates light. It contains no toxic materials. It is known as Durad Luminous Paint.

•

According to the Galland-Henning Mfg. Co., Milwaukee, Wis., its new *Nopak High Pressure Operating Valve* shows no tendency toward pressure locking. With but one moving part, the valve is designed to work on pressures of 1,000 p.s.i. or more.

NAFTOLEN* R100

the *true*

EXTENDER

for

CRUDE RUBBER,

RECLAIM

and

SYNTHETICS

W C=C

Wilmington Chemical Corporation

Wilmington, Delaware

*Reg. U. S. Patent Office

Books....

RUBBER RED BOOK—1941 Edition
Directory of the Rubber Industry
Cloth Bound, $5.00

ANNUAL BIBLIOGRAPHIES OF RUBBER LITERATURE
Compiled by D. E. Cable, Ph.D.
For Years 1935, 1936, 1937, each, Cloth, $2.00
For 1938-1939, Cloth, $4.00

LATEX IN INDUSTRY
By Royce J. Noble, Ph.D.
Text Book on Latex. Price: $7.00

LATEX AND ITS INDUSTRIAL APPLICATIONS (Vol. I)
By Frederick Marchionna
Bibliography of latex patents and literature to June, 1932. Price: $15.00

LATEX AND RUBBER DERIVATIVES AND THEIR INDUSTRIAL APPLICATIONS (Vols. II & III)
By Frederick Marchionna
Bibliography of latex patents and literature from June, 1932 to January, 1937; rubber derivatives to January, 1937. Price: $20.00
(Combination Price, Vols. I, II and III: $30.00)

Published by

THE RUBBER AGE

250 West 57th St. New York City

IT'S ABOUT TIME IN NEW YORK

TIME, always valuable, is now more precious than ever. Save time by staying at the McAlpin. Its ideal midtown location is right where it's most convenient for business or pleasure.

Rooms with private bath
Single from **$3.30**
Double from **$4.95**

- 1 BLOCK FROM PENN STATION
- 5 MINUTES TO TIMES SQUARE
- B. & O. Motor Coaches stop at our door

HOTEL McALPIN
BROADWAY at 34th STREET, NEW YORK
Under KNOTT Management JOHN J. WOELFLE, Manager

REVIEWS

BOOKS

Plastics in Engineering (2nd Edition). By J. Delmonte. Published by Penton Publishing Co., Penton Building, Cleveland, Ohio. 6 x 9 in. 601 pp. $7.50.

The first edition of this book, recognized as one of the most outstanding on the subject of plastics, made its appearance less than two years ago, in April of 1940, to be exact (see RUBBER AGE, May, 1940, p. 122). Circumstances and technological developments have so markedly influenced the trends in the plastics industry in the past twenty months, however, that this second edition was essential to keep the records up-to-date.

Strategic materials, such as brass, zinc, copper, tin, aluminum, magnesium and steel, are now almost wholly restricted to vital war measures. This situation has created a minor revolution in the design of machine parts, as the author points out in his preface, and now, more than ever, manufacturers must become acquainted with ways of adapting plastics to their design programs. With this thought in mind, the data and design information have been completely revised in the new edition so as to be of greatest service to the engineer.

Practically all of the previous chapters have been retained, with several new ones added. The technical data has been reorganized to permit more easy reference to the text material. Extruded plastics and resin-bonded plywoods are given much more prominence because of recent developments in these materials. Among the newer plastics discussed are polyamides, melamine-formaldehyde, polyvinylidene chloride, and methyl cellulose. Useful technical and design data, obtained by the author in his work with the Plastics Industries Technical Institute, are incorporated in the book.

Like other chapters in the book, that on "Synthetic Rubbers and Rubber-Like Resins," has been brought up-to-date. Additions to this chapter include a table on types of synthetic rubber and rubber-like resins, showing the chemical structure (monomer), trade-name of the polymer, and typical applications; a brief discussion of isobutene polymers; and a table giving the physical properties of some of the commercial synthetic rubbers as compared with those of natural rubber.

•

Behold My Brother. By George Rosensteel. Published by the House of Field, Inc., 19 West 44th St., New York, N. Y. 5½ x 8 in. 382 pp. $2.50.

This book was written as a first novel by a rubber worker. Mr. Rosensteel has worked for the Goodyear Tire & Rubber Co. in Akron for the past sixteen years and is currently employed as a trucker in the shipping department. Like most first novels, the author has drawn extensively on his own experiences and contacts, but too many of the situations are melodramatic. The dialogue in the book and the descriptive phrases, too, could be improved upon.

The book deals with rubber workers, labor organizers, pickets, state troopers, and emphasizes the cause and effect of a five-week strike at a mythical rubber factory in a mythical town which is faintly reminiscent of the one suffered at the Goodyear plant in Akron in 1936. It differs, however, from the general run of books of this kind in that instead of showing the malpractices usually attributed to management the theme is the exploitation of labor by heavily-paid union organizers.

The plot of the book is quite "heavy," with the growth of the mythical rubber union traced from the days of the bank holiday of 1933 to the present. It does not parallel that of the actual United Rubber Workers of America, so

Muscles for Rubber

RUBBER is a fighting word in this World War . . . a fighting product made harder, and tougher, and longer-lasting by *reinforcement with carbon black.*

Tanks, trucks, aeroplanes, artillery and naval units, in scores of different ways, depend upon rubber reinforced with carbon black for much of their fighting efficiency, maneuverability and stamina.

Carbon black literally puts "muscles" in this combat rubber. It strengthens it, toughens it and lengthens its life.

It makes our Army, Navy and air equipment fight better and last longer.

The production of carbon black for use on the factory front and on the battle front is a responsibility of the United Carbon Company. That this vital product shall be the finest that this company's resources and man-power can produce, is our Victory Pledge.

UNITED CARBON COMPANY, INC.
Charleston, West Virginia

DIXIEDENSED AND KOSMOBILE STAND FOR THE HIGHEST

DEVELOPMENT IN BLACKS FOR RUBBER COMPOUNDING.

KOSMOS-DIXIE 20, A NEW UNTREATED DUSTLESS

SEMI-REINFORCING CARBON BLACK.

no similarities can be attempted, nor did the author attempt to use the actual union as a pattern. The book contributes little to current labor-management problems in the rubber industry, but because of its background should prove of some interest to members of that industry.

•

Condensed Chemical Dictionary (3rd Edition). Published by the Reinhold Publishing Corp., 330 West 42nd St., New York, N. Y. 6 x 9 in. 756 pp. $12.00.

(*Available from Book Department,* RUBBER AGE)

Although the general arrangement of this third edition of the *Condensed Chemical Dictionary* remains the same as that of the second edition (published in 1930), over 6,000 new items have been added, including chemicals, chemical specialties, hydrogenated products, petroleum products, and minerals. Many new encyclopedic-type definitions have also been added, while the old items carried over from the previous edition have been brought completely up-to-date.

Like the previous edition, the new one gives as much information as possible in condensed form on all materials listed. This information includes data on chemical and physical properties, shipping regulations, typical uses, hazards, and, of course, a brief definition. Not only are chemicals and raw materials listed, but a large number of chemical specialties, sold under trade or brand names, as well. Because so many chemicals and chemical products are now sold under trade or brand names the trend is given full recognition by including these names in the Dictionary.

A new feature which will undoubtedly be most useful is the inclusion of Typical Specifications wherever possible. These have been secured from manufacturers and represent a description of the product as marketed and sold commercially. Some manufacturers' products may differ from the data in slight detail, due perhaps to difference in purity or methods of taking tests, but the difference will not be very great. Inclusion of the specifications should prove of value to both sellers and purchasers, as well as technicians.

In all, the latest edition of the Dictionary contains the names of approximately 18,000 chemicals and their synonyms, carefully cross-indexed so that any material can be quickly located. An appendix gives some 46 tables, ranging from atomic weights to decimal equivalents of fractions. Definitions of units are included. Of special interest is the inclusion of a survey on effects of wartime on chemical prices. The book is tabulated for easy handling.

•

Standards on Electrical Insulating Materials. Published by the American Society for Testing Materials, 260 So. Broad St., Philadelphia, Penna. 6 x 9 in. 450 pp. $2.25.

The latest edition of this annual publication is considerably enlarged by the inclusion of new specifications and tests and several reports and papers. It provides in their latest form as of December, 1941, the 58 specifications and tests issued by A.S.T.M. covering this field. Outstanding activities carried on by A.S.T.M. Committee D-9 on Electrical Insulating Materials are covered in certain reports, one on punching quality of laminated phenolic sheet; a study of measurements of power factor and dielectric constant at ultra-high frequencies; a report on round-robin tests of power factor and dielectric constant for glass; and several discussions on the significance of tests of insulating materials, including dielectric strength.

Seven of the specifications and tests cover insulating varnishes, lacquers and their products and thirteen provide standardized test methods for molded materials. The section covering plates, tubes, and rods includes nine standards and there are six standards in the field of mineral oils, ceramic products and solid filling and treating compounds. Two test methods cover insulating paper; four apply to mica products; and there are eight specifications—four each for various rubber products and textile materials;

LONGER LIFE FOR RUBBER GOODS

One of the sure ways to conserve rubber is to make rubber articles last longer. Toward this end the makers of Johnson's Wax have formulated a group of special wax dressings for rubber goods.

These dressings protect rubber articles with a non-porous wax film that retards deterioration by preventing oxidation.

Johnson's Wax Dressings have already been used with great success on auto parts, vacuum cleaner parts, stair treads, rubber-covered wire, toys and many other products. In addition to preventing or retarding oxidation, the dressings also contribute a natural, long-lasting high lustre.

Because of great coverage (approximately 2,000 feet per gallon, or higher), Johnson's Wax Dressings are extremely economical to use. May be applied by dipping, spraying or wiping onto surface. Available in 5 and 55 gallon drums, and in 1 gallon cans.

Samples and further information will be furnished on request.

S. C. JOHNSON & SON, INC.
Industrial Wax Division
Racine, Wisconsin

NEVILLE
NEVOLL*
Softener and Dispersing Agent

• NEVOLL imparts rapid break-down characteristics to rubber stock, and disperses carbon black and other fillers easily at low cost.

In synthetic rubbers, NEVOLL gives the required softness with minimum production of tack.

Available in tank cars and returnable 55-gallon drums. Prices and samples on request.

*REG. U. S. PAT. OFF.

THE NEVILLE COMPANY
PITTSBURGH • PA.

R-3

Write for this COMPLETE CATALOG ON

Stearns MAGNETIC

CLUTCHES AND BRAKES
CLUTCH - BRAKE COMBINATIONS

Offer definite savings in operating costs and maintenance expense, provide efficient power transmission with near or remote control. Smooth acceleration with fast and positive stop. What's your problem? We invite your inquiry. No obligation. Write for Bulletin 225.

STEARNS MAGNETIC MFG. CO.
640 So. 28th St. Milwaukee, Wis.

Testing Promotes Speed and Quality

An Adequate Testing Routine gives you a firm command of materials and processes. You handle unfamiliar materials confidently. You force top production without loss of control. More than 60 models of *Scott Testers answer every need for tensile, hysteresis, flexing, plasticity, state-of-cure, compression-cutting, etc.

SCOTT TESTERS

* *Registered Trademark*

HENRY L. SCOTT CO. 85 Blackstone St. Providence, R. I.

COLORS for RUBBER

Red Iron Oxides
Green Chromium Oxides
Green Chromium Hydroxides

•

Reinforcing Fillers and Inerts

C. K. WILLIAMS & CO.
EASTON, PA.

RMP for RED RUBBER

ANTIMONY

• ATTRACTIVE
• NON-DETERIORATING

RARE METAL PRODUCTS CO.
BELLEVILLE, N. J.

while four standards give tests and tolerances for various types of glass products and for woven tapes. Six standards give tests covering arc resistance, dielectric strength, power factor and related properties and tests.

This publication, which includes for the first time a detailed index, also includes two tables of contents, one listing standards in numeric sequence. The 1941 report of Committee D-9, with its recommendations on standards, is given.

•

Resins-Rubbers-Plastics. A looseleaf abstract service. Edited by H. Mark and E. S. Proskauer. Published by Interscience Publishers, Inc., 215 Fourth Ave., New York, N. Y. Subscription Price: $35.00 per year.

The first issue of this abstract service, devoted to the complete field of synthetic resins, rubbers and plastics, including the scientific aspects of cellulose and fiber chemistry, consists of 33 pages, each 6½ x 9½ inches in size, and contains the table of contents of the service and a number of abstracts from the January, 1942, issues of various scientific and technical periodicals. The abstracts are fairly comprehensive, containing most of the data and facts of the original paper, with important graphs, curves and apparatus reproduced. The abstracts themselves are subdivided for convenience of the user.

File numbers are provided for each abstract. A key to the file numbers indicates that the reference book will be divided into two parts—General and Special. The General Part will combine all information which does not refer to a specific chemical compound or group of substances, but which is characteristic of or important to a sector of the reviewed field. Main subheadings of this part are Physical and Chemical Properties, Physical and Chemical Methods and Testing, Chemical Statics and Kinetics, Manufacture, Molding and Vulcanization, Finishing of Products, and Applications.

The Special Part will be subdivided according to substances or groups of substances, such as acrylic resins, cellulose plastics, and butadiene rubbers. Within each section of this part, the same scheme is employed as for the General Part. This means, as an example, that all information on the tensile strength of chloroprene rubbers will be coordinated under the same filing number in the same section of the binder, which is supplied at an extra cost of $3.00.

BOOKLETS, CATALOGS, Etc.

Surgical Trade Buyer's Guide: 1942. Published by Surgical Business, Inc., 369 Lexington Ave., New York, N. Y. 6 x 9 in. 100 pp. $1.00.

This is the third edition of the buyer's guide for surgical supply, hospital supply and orthopedic appliance dealers. It has more pages and more listings than the two previous editions, with all material brought completely up-to-date. It is divided into two sections, one devoted to surgical supplies and the other to orthopedic appliances. Various sources of supply for rubber products used in the fields covered are given.

•

Airships for National Defense and Commerce. Goodyear Tire & Rubber Co., Akron, Ohio. 12 x 9 in. 24 pp.

The pages of this colorful brochure illustrate the versatility of the airship, from the non-rigid training and patrol craft of 125,000 to 450,000 cubic feet to the airplane mother ship or overseas passenger liner of 10,000,000 cubic feet. Both civil and military functions of lighter-than-air craft are stressed, although it is realized that the civil field must now await the passing of the war. The part played by barrage balloons in the war effort is also discussed.

1942 Year Book of the Los Angeles Rubber Group. Published by the Group (Secretary, C. R. Wolter, c/o Kirkhill Rubber Co., 811 West 58th St., Los Angeles, California). 8½ x 11 in. 16 pp.

This is the first of a series of planned annual year books to be issued by the Los Angeles Group, Rubber Division, A.C.S. It is dedicated to Edward L. Royal of H.M. Royal, Inc., "in appreciation of his unselfish devotion." The book contains a list of past chairmen of the group, current officers and committee members, by-laws, names and addresses of all members, and lists of rubber manufacturers and suppliers to the industry located in the Pacific Coast area. The latter two lists were reproduced from the 1941 RUBBER RED BOOK.

•

Surgical Dressings. Johnson & Johnson, New Brunswick, N. J. 6 x 9 in. 80 pp.

The manufacture and use of surgical dressings, including adhesive tape, is excellently told by word, diagram and picture in this new booklet. Manufacturing procedures outlined are those practiced in the Johnson & Johnson plants, but the balance of the information included is of a general nature and of special interest to hospitals and institutions. The manufacture of adhesive plaster, including the preparation and application of the rubber, is told pictorially, with accompanying text further explaining some of the steps involved.

WANT ADS

RATES: Five cents per word, minimum charge $2.00, except POSITIONS WANTED, $1.00 for 40 words or less, extra three cents per word. All classified advertisements payable in advance. Address replies to box numbers care of RUBBER AGE, 250 West 57th St., New York.

HELP WANTED

CHEMIST—familiar and experienced in the manufacture of sheet rubber products, rubberized fabrics, pyroxalin coatings, and rubber sundries. Capable of assisting in factory management and production. State experience in full. All communications strictly in confidence. Address BOX 1216, RUBBER AGE.

SUPERINTENDENT—For modern Rubber Plant employing 250 to 300 people. Must be familiar with production methods, milling, tubing, braiding, lead covering, vulcanizing and molding. State age, education, experience, present earnings and salary expected. Address Box 1218, RUBBER AGE.

EQUIPMENT WANTED

WANTED: 1—Banbury Mixer; 2—Mills; 1—Calender; 5—Hydraulic Presses, with pump and accumulator; 2—Tubers. Address Box 1014, RUBBER AGE.

WANTED IMMEDIATELY—Banbury Mixer; Mills, 40 in. to 72 in.; Presses, 16 in. ram minimum; also steel press platens; must be in perfect condition. Address Box 1217, RUBBER AGE.

FOR SALE

FOR SALE: 1—Watson-Stillman, Hydro-Pneumatic Accumulator; 1—5 ft. dia. Vulcanizer, with quick opening door; 20—Semi-Automatic Hydraulic Presses; 1—Farrel-Birmingham 16" x 36" Rubber Mill, m.d.; 1—Royle ¼" Tuber; 1—38" x 78" Hydraulic Press; Hydraulic Pumps, Calenders, Tubers, etc. CONSOLIDATED PRODUCTS CO., INC., 14 Park Row, New York, N. Y.

SOFTENERS and PLASTICIZERS
For RUBBER
From the Pine Tree

ROSIN OIL
PINE TAR
BURGUNDY PITCH
GALEX a non-oxidizing RESIN
Send for "Pine Tree Products" *Booklet*

NATIONAL ROSIN OIL & SIZE CO.
R. K. O. BUILDING, RADIO CITY, NEW YORK, N. Y.
Plant: Savannah, Ga. Branches in Principal Cities
"PIONEERS OF THE INDUSTRY"

ERNEST JACOBY & CO.

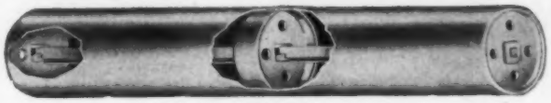
Crude Rubber — *Liquid Latex*
Crown Rubber Clay — *Carbon Black*
Rubber Chemicals — *Rubber Colors*

Stocks of above carried at all times

BOSTON - 79 Milk St. - MASS.

Cable Address: Jacobite Boston

New and Better
GAMMETER'S
ALL STEEL ALL WELDED
CALENDER STOCK SHELL



4" 5" - 6" - 8" - 10" - 12" diameters, any length.

Besides our well known Standard and Heavy Duty Constructions, we can supply light weight drums made up to suit your needs.

THE W. F. GAMMETER COMPANY
CADIZ, OHIO

The CARTER BELL MFG CO

Springfield New Jersey

Stamford Neophax Vulcanized Oil

(REG. U. S. PAT. OFF.)

For Use With Neoprene

THE STAMFORD RUBBER SUPPLY CO. STAMFORD CONN.

Makers of Stamford Factice Vulcanized Oil Since 1900

CROWN CLAY

APPROVED BY RUBBER CHEMISTS

SOUTHEASTERN CLAY COMPANY, AIKEN, SOUTH CAROLINA

CROWN CLAY

AIR BAG BUFFING MACHINERY
STOCK SHELLS HOSE POLES
MANDRELS

NATIONAL SHERARDIZING & MACHINE CO.
868 Windsor St. Hartford, Conn.
Representatives: Akron San Francisco New York

12 Issues a Year
$3.00 Annual Subscription
THE RUBBER AGE

SOLVING PRODUCT PROBLEMS

Shortages—Seller's Market—Substitutes. These are by-words in industry today. The product problems of manufacturers are many. When brought to us, we give each and every need careful and sincere attention. A new friend now may be a real friend for years.

As a source for talcs, clays and pigments for over fifty years, good service and satisfied customers have placed us in the high position we are in today.

With the diminishing of available raw materials, we must keep faith with our regular clients and new ones who seek us out.

Our Research Department is giving increased time and effort to find suitable alternatives for unobtainable products, not forgetting that

QUALITY IS OUR FIRST CONSIDERATION.

for...
COSMETIC • PAINT • RUBBER
and Allied Manufacturers

Quality is our first consideration

CHICAGO: Harry Holland & Sons
PHILADELPHIA: Pelts & Company
TORONTO: Richardson Agencies, Ltd.

WHITTAKER, CLARK & DANIELS, INC.
260 WEST BROADWAY • NEW YORK CITY

2451

MARKETS

Rubber – Crude, Reclaimed and Scrap – Cotton – Ducks – Tire Fabrics – Sheetings

NEW YORK, MARCH 9, 1942

Crude Rubber

SINCE the sale of crude rubber and latex is now restricted to the Rubber Reserve Company, there is no longer any so-called free rubber available. Trading in rubber futures on the Commodity Exchange has been suspended and a committee is now at work to determine terms for the liquidation of the few open contracts remaining. This situation means that the crude rubber dealer is now confined to handling Manufacturers' Crude Rubber Purchase Permits. Because the larger consumers of rubber purchase supplies direct from the Rubber Reserve Co. dealers can work with smaller manufacturers only and since some of the latter type manufacturers are no longer permitted to manufacture certain products this field of activity is limited. Therefore, several old and reliable dealers and brokers have faded from the scene.

The situation in crude rubber remains critical. According to recent testimony of Jesse Jones, Secretary of Commerce and Lend-Lease Administrator, the present stockpile of crude amounts to approximately 600,000 tons. There are still some shipments afloat, but the total is far less than recent optimistic reports. Additional supplies from the Far East, now that the Japanese are in complete control, are impossible, at least until such time as the United Nations launch their counter-offensive in that area. There seems to be little question but that such an offensive is a matter of time.

In the meantime the government is doing everything possible to assure new supplies of rubber. The synthetic rubber program has been stepped up to where the goal is now at least 500,000-ton capacity per year. The guayule bill has become law and the Department of Agriculture has already started new plantings in the Salinas Valley, Calif., area. A deal has been made with Brazil under which money has been made available for rapid exploitation of crude rubber potentialities in that country. The general Latin-American program for crude rubber cultivation continues.

Current quotations, including those fixed by the Rubber Reserve Co., follow:

As of March 9

Fixed Government Prices

Plantations—

Ribbed Smoked Sheets—

No. 1 Spot	—	@	.22½
No. 2	—	@	.22¼
No. 3	—	@	.22
No. 4	—	@	.21¾
Thin Latex Crepe	—	@	.23 7/8
Thick Latex Crepe	—	@	.23 7/8
Brown Crepe, No. 1	—	@	.21 3/8
Brown Crepe, No. 2	—	@	.21 1/8
Amber Crepe, No. 2	—	@	.21 3/8
Amber Crepe, No. 3	—	@	.21 1/8
Brown Crepe, Rolled	—	@	.17 1/8

Latex—

Normal, carload lots, tanks	—	@	.2595
Normal, carload lots, drums	—	@	.2825
Conc., carload lots, tanks	—	@	.2765
Conc., carload lots, drums	—	@	.2950

Outside Market Prices

Paras—

Up-River, fine	—	@	.38
Acre Bolivian, fine	—	@	.38

Balata—

Brazilian block	—	@	.10

Scrap Rubber

Due to the rationing of new tires and tubes, as well as retreads and recaps and retreading and recapping, few used tires are finding their way into scrap piles. Despite ridiculously high prices put on used tires which a few months ago would have been quickly discarded, these tires are being purchased by near-desperate motorists. Accordingly, the scrap rubber situation is quite tight and will probably remain tight until the government takes some action to alleviate the situation. Dealers intimate that such action is contemplated in the near future. Prices for scrap rubber listed below are ceiling prices covered in O.P.A. Schedule No. 87:

(Prices to Consumers, Delivered Akron)

Mixed passenger tires	ton	18.00
Beadless passenger tires	ton	24.00
Passenger S.A.G.	ton	18.50
Mixed truck tires	ton	18.00
Beadless truck tires	ton	24.00
No. 1 truck S.A.G.	ton	16.50
No. 2 truck S.A.G.	ton	16.50
No. 1 passenger peelings	ton	47.50
No. 2 passenger peelings	ton	30.00
No. 3 passenger peelings	ton	27.50
No. 1 truck peelings	ton	47.50
No. 1A truck peelings	ton	50.00
No. 2 truck peelings	ton	30.00
No. 3 truck peelings	ton	27.50
No. 1 light colored carcass	ton	52.50
No. 2 light colored carcass	ton	50.00
Gray carcass	ton	47.50
No. 2 passenger tubes	lb.	.07¾
No. 2 passenger tubes, lt. col.	lb.	.08¼
Red passenger tubes	lb.	.07½
Black passenger tubes	lb.	.06¾
Mixed passenger tubes	lb.	.06¾
No. 2 truck tubes	lb.	.07½
Red truck tubes	lb.	.07¼
Black truck tubes	lb.	.05¼
Two-toned black-gold tubes	lb.	.06¾
Two-toned red-black tubes	lb.	.06½

Tire Fabrics

The situation in the tire fabric field remains unchanged, with practically no demand for such fabrics. Consequently, prices are nominal and in many quarters are not even being quoted. The prices shown below are those which were in force on or about January 15.

(Prices Net at the Mill)

Peeler, carded, 23/5/3	lb.	.43½ @	.44
Peeler, carded, 23/4/3	lb.	.44½ @	.45
Peeler, carded, 15/3/3	lb.	.41½ @	.42
Peeler, carded, 15/4/2	lb.	.41½ @	.42
Peeler, carded, 13/3/3	lb.	.40½ @	.41

CHAFERS

Carded, American, 1 1/8"	lb.	.43½ @	.44
Carded, American, 1"	lb.	.39½ @	.48

Sheetings

48x40	36 in.	5.50	lb.	— @	7.546
40x40	36 in.	6.15	lb.	— @	6.748
40x36	36 in.	6.50	lb.	— @	6.385
48x48	40 in.	2.50	lb.	— @	15.600
48x48	40 in.	2.85	lb.	— @	13.684
56x60	40 in.	3.60	lb.	— @	11.528
48x44	40 in.	3.75	lb.	— @	10.666

Note: These are ceiling prices, and will remain as quoted as long as cotton is in the price range of 19.05 to 19.48 on coarse goods and 18.99 to 19.48 on fine goods.

Cotton

The price of spot cotton has swung in a narrow 44 point range since our last report. Starting with 19.86 on February 11, high for the period, the price moved upward slowly but steadily until it reached 20.30 on February 20. More active trade participation than had been evident for some time was largely responsible for the upward trend. Since February 20 quotations have been spotty, rising and falling from day to day. Switches and March liquidation were principal trading factors in the last week of February. In the past several days there has been a good bit of hedging in the market, most of which was balanced by trade buying. Secretary of Agriculture Wickard has called upon cotton farmers to plant their full acreage allotment of 27,400,000 acres and has recommended that as much of the area as possible be planted to medium and long staples in order to assure adequate supplies of the qualities needed by military requirements. The statement did not intend to convey the thought that allotments will be increased or that farmers were being asked to exceed their quotas. Quotations for middling uplands on the Exchange follow:

	Feb. 10	March 9		
	Close	High	Low	Close
March	18.35	18.37	18.36	18.36
July	18.49	18.63	18.55	18.57
October	18.61	18.71	18.62	18.63

Reclaimed Rubber

Demand for reclaim continues at the feverish pace established since restrictions on consumption of crude rubber were put into effect with the use of crude limited to certain specific classes of products and reclaimers continue their efforts to meet as much of the demand as possible. Although there seems to be a temporary bottleneck in the supply of scrap, reclaimers believe this situation will be straightened out in the early future, probably with the help of government agencies. Prices shown below, for carload and less than carload shipments, are covered by O.P.A. Price Schedule No. 56:

Shoe

Unwashed	lb.	.07 @	.07¼

Tube

Black Tube	lb.	.11¼ @	.11½
Red Tube	lb.	.12 @	.12¼

Tires

Black (acid process)	lb.	.07½ @	.07¾
Black, selected tires	lb.	.06½ @	.06¾
Truck, Heavy Gravity	lb.	.08½ @	.08¾

Miscellaneous

Mechanical blends	lb.	.04½ @	.05½
White	lb.	.13 @	.13¼

Ducks

Enameling (single filling)	lb.	.44 @	.45
Belting and Hose	lb.	— @	.36½
Single filling, A grade	lb.	.20 @	.21
Double filling, A grade	lb.	— @	.21½

CHEMICAL MARKETS

New York, Mar. 9, 1942
All Prices F.O.B. Works

ACCELERATORS

Organic

A-1 (Thiocarbanilid)	lb.	.26 @	.35
A-10	lb.	.34 @	.40
A-11	lb.	.52 @	.65
A-19	lb.	.52 @	.65
A-32	lb.	.70 @	.80
A-77	lb.	.42 @	.55
A-100	lb.	.42 @	.55
Aldehyde ammonia, crystals	lb.	.65 @	.70
Altax	lb.	.45 @	.50
Beutene	lb.	.60 @	.65
Butyl Zimate	lb.	— @	1.15
Captax	lb.	.40 @	.45
Crylene	lb.	.40 @	.47
Di-Ortho-Tolyguanidine	lb.	.44 @	.46
Diphenylguanidine	lb.	.35 @	.36
El-Sixty	lb.	.50 @	.65
Ethyl Zimate	lb.	— @	1.15
Ethylidene aniline	lb.	.42 @	.43
Formaldehyde aniline	lb.	.31 @	—
Guantal	lb.	.40 @	.50
Hepteen	lb.	.35 @	.40
Hexamethylenetetramine	lb.	.33 @	—
Lead Oleate, No. 999	lb.	.13 @	—
Witco	lb.	.15 @	—
Methyl Tuads	lb.	— @	1.55
Methyl Zimate	lb.	— @	1.25
Monex	lb.	— @	1.55
Phenex	lb.	.50 @	.55
Pip-Pip	lb.	— @	1.90
R & H 50-D	lb.	.42 @	.43
R-2	lb.	1.40 @	1.80
R-2 Crystals	lb.	2.50 @	2.75
RN-2	lb.	1.40 @	1.80
RN-2 Crystals	lb.	1.90 @	2.15
Rotax	lb.	.50 @	.55
Safex	lb.	1.20 @	1.30
SPDX	lb.	.70 @	.75
Super-Sulphur No. 1	lb.	.50 @	—
No. 2	lb.	.14 @	.16
Thiocarbanilid, drums	lb.	.26 @	.35
Thiurad	lb.	— @	1.75
Trimene	lb.	.55 @	.65
base	lb.	1.05 @	1.20
Triphenylguanidine	lb.	.45 @	—
Ulto	lb.	1.25 @	1.75
Ureka	lb.	.60 @	.75
Blend B	lb.	.60 @	.75
Blend C	lb.	.56 @	.65
Vulcanex	lb.	.42 @	.43
Vulcanol	lb.	.85 @	—

Inorganic

Litharge, domestic	lb.	.07 @	.07½
Magnesia, calcined, heavy	lb.	.04 @	—

COLORS

Blacks (See Next Column)

Blues [b]

Prussian	lb.	.36 @	—
Ultramarine	lb.	.16 @	.27

Browns [b]

Mapico	lb.	.11 @	—
Umber, Turkey	lb.	.04¼ @	.05⅞

Greens [b]

Chrome	lb.	.23 @	.32
Guignet's Green	lb.	.70 @	—

Reds

Antimony crimson, 15/17	lb.	— @	—
sulfur, free	lb.	— @	—
Indian	lb.	.08¾ @	—
Domestic (Maroon)	lb.	.11 @	—
Mapico	lb.	.09¼ @	—
Red oxide, pure	lb.	.10 @	.12
Rub-Er-Red	lb.	.09¼ @	—

Whites

Cryptone No. 19	lb.	.05¼ @	.05½
Cryptone CB No. 21	lb.	.05¼ @	.05½
Cryptone ZS-86	lb.	.07¾ @	.08
Cryptone ZS-230	lb.	.07¾ @	.08
Cryptone ZS-800	lb.	.07¾ @	.08
Lithopone:			
Albalith	lb.	.0385 @	.0410
Azolith	lb.	.0385 @	.0410
Ray-bar	lb.	.05½ @	.05¾
Ray-cal	lb.	.05½ @	.05¾
Rayox	lb.	.14½ @	.15¼
Titanox A	lb.	.13½ @	.13¾
Titanox B	lb.	.05½ @	.05¾
Titanox C	lb.	.05¼ @	.05½
Zinc Oxide—American Process			
American Azo:			
ZZZ (lead free)	lb.	.06½ @	.06¾
Anaconda, lead free	lb.	.06½ @	.06¾
Horsehead Lead Free Brand:			
Special—3	lb.	.06½ @	.06¾
XX Red—4	lb.	.06½ @	.06¾
XX Red—72	lb.	.06½ @	.06¾
XX Red—103	lb.	.06½ @	.06¾
Kadox, black label—15	lb.	.06½ @	.06¾
Red label—17	lb.	.06½ @	.06¾
St. Joe, black label	lb.	.06½ @	.06¾
green label	lb.	.06½ @	.06¾
red label	lb.	.06½ @	.06¾
U. S. P.—7, bbls.	lb.	.09½ @	.09¾
Zinc Oxide—French Process:			
Florence White Seal—7 bbls.	lb.	.08½ @	.08¾
Green seal—8	lb.	.08 @	.08¼
Red seal—9	lb.	.07½ @	.07¾
Yellows [b]			
Cadmolith	lb.	.50 @	.55
Chrome	lb.	.16 @	—
Mapico	lb.	.06¾ @	—

BLACKS

(In bags, carload lots)

Aerfloted Arrow	.0355 @	—
Certified	.0355 @	—
Certified Spheron	.0355 @	—
Continental	.0355 @	—
Disperso	.0355 @	—
Dixiedensed	.0355 @	—
Dixiedensed 66	.0355 @	—
Excello	.0355 @	—
Furnex	.03½ @	.06
Furnex Beads	.03½ @	.06
Gastex	.03½ @	.06
Kosmobile	.0355 @	—
Kosmobile 66	.0355 @	—
Kosmos-Dixie 20	.03½ @	.06
Micronex (Amarillo)	.0355 @	—
Micronex Beads (Amarillo)	.0355 @	—
Pelletex	.03½ @	.06
P-33	.0475 @	—
Shell Carbon (Del. Midwest)	.024 @	—
Supreme	.0355 @	—
Thermax	.0225 @	—
Wyex	.0355 @	—

COMPOUNDING MATERIALS

Aluminum Flake	ton	21.85	@24.50
Asbestine	ton	16.50	@20.00
Barium carbonate (98-100%)	ton	47.00	@49.00
Barytes	ton	25.35	@36.00
Bentonite	ton	11.00	@16.00
Blanc fixe, dry	ton	60.00	@67.50
Calcene	ton	37.50	@43.00
Catalpo (fact.)	lb.	.02 @	—
Chalk, precipitated			
Suprex white, extra lt.	ton	45.00	@60.00
heavy	ton	45.00	@55.00
Clay, Aerfloted, Suprex	ton	10.00	@22.00
Crown (f.o.b. plant)	ton	10.00	@ —
Dixie	ton	11.00	@23.50
Langford	ton	—	@ 8.50
McNamee	ton	10.00	@22.50
Par	ton	—	@11.00
Witco	ton	10.00	@ —
Cotton Flock (Dark)	lb.	.10½ @	.13
Kalite No. 1	ton	26.00	@52.00
Kalite No. 3	ton	36.00	@62.00
Kalvan	ton	100.00	@126.00
Magnesium carbonate	lb.	.06¼ @	—
Mica	ton	35.00	@44.00
Mineralite	ton	—	@30.00
Pyrax A	ton	7.50	@20.00
Rottenstone (powd. Dom.)	ton	25.50	@37.50
Rubberol	lb.	.16 @	.16½
Silene (calcium silicate)	lb.	.04 @	.045
Starch, powdered	cwt.	2.90 @	4.10
Talc, domestic	ton	17.00	@25.00
Whiting, commercial	ton	16.00	@26.00
Columbia Filler	ton	9.00	@14.00
Witco	ton	6.00	@ —
Wood Flour (100 mesh)	ton	30.00	@32.00

MINERAL RUBBER

285°-300° Mineral Rubber	ton	22.00 @	—
Black Diamond	ton	25.00 @	—
Genasco, solid (factory)	ton	— @	—
Hard Hydrocarbon	ton	25.00 @	42.00
Parmr, solid	ton	— @	—
Pioneer, MR, solid	ton	— @	—

MISCELLANEOUS

Aromatics—Rodo #0	lb.	4.00 @	4.50
Rodo #10	lb.	5.00 @	5.50
Curodex 19	lb.	2.75 @	—
Curodex 188	lb.	3.50 @	—
Curodex 198	lb.	4.50 @	—
Para-Dors	lb.	4.50 @	—
Aresklene No. 375 (dispersing, wetting and penetrating agent)	lb.	.35 @	.50
Darvan (dispersing agent)	lb.	.30 @	.39
Santomerse S (dispersing, wetting, penetrating and stabilizing agent)	lb.	.11 @	.25
Sponge Paste	lb.	— @	.18
Sunproof	lb.	.23 @	.28
Tackol (tackifier)	lb.	.085 @	.18
Tonox	lb.	.52 @	.61
Ty-Ply R (and S)	gal.	6.75 @	8.75
Unicel (blowing agent)	lb.	.50 @	—

SOFTENERS

Acids

Acetic, 28%, bbls. [a]	100 lb.	3.38 @	3.63
Nitric, 36 degrees	cwt.	5.00 @	—

Acids, Fatty

Laurex	lb.	.15 @	.17½
SL #10	lb.	.12 @	.14
Stearex Beads	lb.	.10 @	.11
Stearic, double pressed	lb.	.12½ @	.13½
Stearite	lb.	.10 @	—

Alkalies

Caustic Soda, 76%	cwt.	2.70 @	5.70
Soda Ash, 58%	cwt.	1.15 @	2.98

Oils

Cycline Oil	gal.	.14 @	.20
Degras, bbls.	lb.	.12 @	.12½
Fluxrite	lb.	.05½ @	.06½
Para-Flux	gal.	.08½ @	.18
Para-Lube	lb.	.425 @	.48
Petrolatum, amber [b]	lb.	.03½ @	.04½
Pigmentaroil, tank cars	gal.	.20½ @	—
in drums	gal.	.29 @	.30
Pine, steam distilled	gal.	1.20 @	—
Rosin Oil, cmpd.	gal.	.40 @	—
Rubberol	lb.	.13½ @	.14
Rubtack	lb.	.10 @	—
Seedine, c.l.	lb.	.07¼ @	—
Tackol	lb.	.08½ @	.18
Witco Palm Oil	lb.	— @	—
Witco Softener No. 20	gal.	.20 @	—
Woburn No. 8, c.l.	lb.	.06 @	—

Resins and Pitches

Pitch, Burgundy	lb.	.06 @	.06½
coal tar	ton	19.00 @	22.00
hardwood	ton	16.00 @	22.50
pine, 200 lb. gr. wt. bbl.		6.00 @	6.50
Pigmentar, tank cars	gal.	.20½ @	—
in drums	gal.	.29 @	.30
R. S. L. Resin	lb.	— @	—
Retort Pine Tar, drums	gal.	.29 @	.30

Solvents

Acetone, pure [a]	lb.	.07 @	.173
Benzene, 90%, tank car	gal.	.14 @	—
Beta-Trichlorethane	gal.	— @	.20
Bondogen	lb.	.98 @	1.25
Carbon, bisulfide	lb.	.05 @	.08½
Carbon tetrachloride	gal.	.73 @	1.27
Dichlorethylene	lb.	— @	—
Dipentene, cml., drums	gal.	.48 @	.50
Ethylene dichloride	lb.	.07½ @	.08½
Plastogen	lb.	.07¾ @	.12
Reogen (drums)	lb.	.11½ @	.15
Rub-Sol	gal.	.09½ @	—
Trichlorethylene	lb.	.08 @	.09½
Turpentine, spirits	gal.	.82 @	.86
dest. dist., drums	gal.	.60 @	.65

Waxes

Beeswax, white [b]	lb.	.61 @	—
Carnauba, yellow [b]	lb.	.86 @	.88
Ceresin, white, dom.	lb.	.13½ @	.15
Montan, crude	lb.	.45 @	.46
Paraffin [a]			
Yellow crude scale, 124/126	lb.	.04¼ @	—
Refined, 123/125	lb.	.05¼ @	—

ANTI-OXIDANTS

Agerite Alba	lb.	2.00 @	2.15
Gel	lb.	.57 @	.59
Hipar	lb.	.65 @	.67
Powder	lb.	.52 @	.54
Resin	lb.	.52 @	.54
Resin D	lb.	.52 @	.54
White	lb.	1.25 @	1.40
Albasan	lb.	.70 @	.75
Antox	lb.	— @	.56
B-L-E	lb.	.52 @	.61
Flectol B	lb.	.52 @	.65
Flectol H	lb.	.52 @	.65
Flectol White	lb.	.90 @	1.15
Neozone A, B, C, D, E	lb.	.52 @	.63
Oxynone	lb.	.77 @	.90
Retardex	lb.	.45 @	.48
Santoflex B	lb.	.52 @	.65
Santovar A	lb.	1.15 @	1.40
S.C.R.	lb.	.33 @	.35
Stabilite	lb.	.52 @	.54
Stabilite Alba	lb.	.70 @	.75
VGB	lb.	.52 @	.61

LUBRICANTS—MOLD & RUBBER SURFACE

Aresklene	lb.	.35 @	.50
Cocoa Soapstock	lb.	.06 @	.08
Colite	gal.	.90 @	1.15
Dipex	lb.	.06 @	.08
Glycerized Liquid Lubricant	gal.	1.15 @	1.20
Lubrex	lb.	.25 @	.30
Mineralite	ton	— @	30.00
Mold Paste	lb.	.12 @	.18
Sericite	ton	65.00 @	75.00
Soap Tree Bark, cut, sifted	lb.	.06 @	.08

FACTICE OR RUBBER SUBSTITUTES

Amberex	lb.	.25 @	—
Amberex Type B	lb.	.18¾ @	—
Black	lb.	.08 @	.12
White	lb.	.08½ @	.13½
Brown	lb.	.08 @	.11½
Neophax A	lb.	.119 @	—

VULCANIZING INGREDIENTS

Dispersed Sulfur No. 2	lb.	.08 @	.12
Sulfur Chloride, yellow (drs.)	lb.	.03 @	.08
Sulfur, rubber makers			
Refined (bags)	cwt.	2.40 @	—
Commercial (bags)	cwt.	2.05 @	—
Telloy	lb.	1.75 @	—
Vandex	lb.	1.75 @	—

[a] Price Ceilings.
[b] Price Suggestions or Agreements.

STATISTICS

SPECIAL NOTE: Much of the statistics carried in this section is of military value and accordingly have been discontinued for the duration of the war. See explanatory footnotes under each table.

U. S. Imports and Exports of Crude Rubber

YEARS	Gross Imports: Long Tons	Gross Imports: Total Declared Value	Gross Imports: Average Declared Value per pound Cents	Re-exports: Long Tons	Re-exports: Total Declared Value	Re-exports: Average Declared Value per pound Cents	Net Imports: Long Tons
1924	325,899	173,367,272	23.75	10,309	6,057,637	26.23	315,590
1925	393,370	426,167,504	48.36	14,827	19,847,753	59.76	378,543
1926	409,944	501,131,064	54.57	17,671	22,470,583	56.77	392,273
1927	424,733	338,688,492	35.60	27,775	24,735,488	39.76	396,958
1928	432,633	242,727,423	25.05	32,159	18,128,761	25.17	400,474
1929	560,082	239,177,811	19.06	36,485	16,868,718	20.64	523,597
1930	482,083	139,133,048	12.88	30,205	9,310,205	13.76	451,878
1931	497,176	72,922,845	6.55	25,595	4,255,572	7.42	471,581
1932	409,556	31,936,459	3.48	20,930	2,015,612	4.30	388,626
1933	407,817	44,034,064	4.82	20,537	2,601,352	5.65	387,280
1934	449,513	97,929,676	9.73	23,848	5,770,109	10.80	425,665
1935	453,134	115,299,448	11.36	11,389	3,084,331	12.09	441,745
1936	467,064	152,072,496	14.54	12,581	4,488,223	15.93	454,483
1937	574,600	237,307,041	18.44	7,902	3,385,433	19.02	566,698
1938	397,620	125,357,730	14.07	5,652	1,799,124	14.21	391,968
1939	469,803	167,558,245	15.92	13,125	5,832,618	19.84	456,678
1940	780,820	303,117,726	17.33	7,060	3,197,136	20.22	773,760
1941*	739,678	301,224,726	18.18	4,177	2,116,945	22.63	735,501
1940:							
Sept.	75,770	29,317,540	17.27	666	349,443	23.43	75,104
Oct.	73,179	27,975,598	17.07	316	123,216	17.38	72,863
Nov.	69,844	26,917,136	17.21	126	52,020	18.45	69,718
Dec.	94,172	36,369,973	17.24	205	94,422	20.52	93,967
1941:							
Jan.	84,201	33,370,482	17.69	292	138,009	21.11	83,909
Feb.	70,745	28,469,753	17.97	327	144,139	19.69	70,418
Mar.	84,991	34,030,846	17.88	329	163,375	22.19	84,662
Apr.	61,288	24,193,639	17.62	238	99,371	18.96	61,054
May	98,438	39,537,574	17.93	370	204,865	24.72	98,068
June	62,124	25,179,498	18.09	476	257,254	24.13	61,648
July	94,622	39,296,581	18.54	423	219,597	23.17	94,199
Aug.	104,057	44,101,058	18.92	973	488,299	22.40	103,084
Sept.	79,212	33,045,295	18.62	749	402,036	23.96	78,463

Note: Statistics supplied by the Department of Commerce. Publication of figures discontinued with those of September, 1941, for the duration of the war. Gross Imports shown do not include latex or guayule. (*) First 9 months only.

United States Imports of Guayule, Balata, Jelutong, Liquid Latex

(All Quantities in Long Tons)

	Guayule Tons	Guayule Dollars	Balata Tons	Balata Dollars	Jelutong Tons	Jelutong Dollars	Liquid Latex Tons	Liquid Latex Dollars
1924	1,356	536,392	464	568,456	6,165	1,237,100	2,157	864,059
1925	3,781	1,803,448	517	574,750	6,749	1,642,531	3,272	3,537,510
1926	4,305	2,562,096	354	327,213	7,263	3,127,757	3,394	4,686,743
1927	5,018	2,674,957	582	477,246	7,785	2,448,657	1,495	1,170,650
1928	3,077	1,755,685	731	430,855	7,552	2,540,059	4,007	2,121,786
1929	1,275	545,175	728	566,964	8,204	2,458,126	3,729	1,788,391
1930	1,096	347,388	502	422,684	5,907	1,403,244	4,458	1,508,786
1931	....	.....	1,207	411,380	5,777	1,019,010	4,675	888,909
1932	....	.....	707	147,403	4,607	616,596	5,112	601,999
1933	....	.....	1,659	2,261,869	5,990	944,895	11,085	1,833,671
1934	398	75,349	1,054	438,209	4,987	943,752	13,107	3,643,221
1935	459	86,835	615	188,384	5,644	1,063,126	13,553	3,782,222
1936	1,229	286,552	535	199,368	6,163	1,296,364	19,852	6,659,899
1937	2,694	745,873	354	151,344	7,109	2,017,786	23,185	10,213,670
1938	2,485	623,819	509	181,140	9,132	2,944,504	11,878	4,147,318
1939	2,332	463,345	694	265,553	6,640	1,603,418	27,438	10,467,552
1940	3,634	758,007	648	300,500	7,451	2,449,137	33,789	14,593,466
1941*	3,536	812,966	581	257,326	5,495	1,789,227	20,775	9,280,551
1940:								
Sept.	250	49,845	40	19,245	712	246,641	2,953	1,337,487
Oct.	381	77,286	70	38,092	1,150	382,168	1,156	512,153
Nov.	392	78,587	67	43,939	445	152,297	2,308	1,169,086
Dec.	278	62,586	54	39,471	1,102	341,876	3,534	1,539,957
1941:								
Jan.	447	104,128	57	32,910	698	221,911	2,184	1,019,741
Feb.	283	65,942	41	22,790	768	245,732	2,946	1,279,648
Mar.	426	98,187	36	16,147	715	258,514	1,707	774,225
Apr.	423	95,916	64	18,533	514	189,520	1,594	648,217
May	334	76,414	61	44,381	822	287,249	2,632	1,117,226
June	383	86,949	67	30,470	552	179,779	2,070	936,944
July	411	94,874	100	34,119	830	215,176	2,049	930,126
Aug.	499	111,502	41	19,344	159	50,934	1,984	779,079
Sept.	330	79,054	114	38,632	437	140,412	3,609	1,795,345

Note: Statistics supplied by the Department of Commerce. Publication of figures discontinued with those of September, 1941, for the duration of the war. Figures shown for latex are dry rubber content. (*) First 9 months only.

U. S. Consumption of Crude Rubber

(Including Latex)

	Figures on Monthly Basis: 1934	1935	1936	1937	1938	1939	1940	1941
Jan.	39,190	46,636	48,631	50,879	31,265	47,387	58,061	65,989
Feb.	40,515	42,720	36,841	51,950	25,357	43,422	52,078	62,692
Mar.	47,003	42,153	42,813	54,129	32,389	51,416	52,454	69,024
Apr.	44,853	44,247	52,031	51,859	29,730	45,268	52,361	71,374
May	42,918	41,101	50,612	51,795	30,753	45,484	54,513	71,365
June	40,147	36,156	52,772	51,860	32,540	48,438	47,834	84,912
July	32,553	35,917	48,250	43,703	34,219	44,975	48,354	68,653
Aug.	33,216	38,775	46,777	41,506	40,552	51,740	53,307	55,365
Sept.	30,258	37,086	46,449	43,945	40,183	51,402	52,469	53,655
Oct.	31,253	41,969	49,637	38,754	42,850	57,155	59,644	60,418
Nov.	34,748	42,310	50,433	34,025	49,050	55,677	57,716	N.A.
Dec.	36,569	42,474	49,754	29,195	48,143	49,636	59,709	N.A.
Tot.	453,223	491,544	575,000	543,600	437,031	592,000	648,500	663,447*

Note: Figures for 1934 to 1940, inclusive, are based on the annual surveys conducted by the former Leather & Rubber Division of the Bureau of Foreign & Domestic Commerce; figures for 1941 are estimates of the Rubber Manufacturers Association. Publication of figures was discontinued with those of October, 1941, for the duration of the war. (N.A.) Not Available. (*) First 10 months only.

Reclaimed Rubber in the United States

(All Quantities in Long Tons)

Year	Production	Consumption Tons	Consumption % to Crude	Stocks	Year	Production	Consumption Tons	Consumption % to Crude	Stocks
1932	75,656	77,500	23.3	16,334	1937	185,033	162,000	29.8	28,800
1933	93,587	85,000	21.2	17,780	1938	122,400	120,800	29.9	23,000
1934	108,162	100,855	22.3	20,000	1939	186,000	170,000	28.7	25,250
1935	122,948	117,523	23.9	17,000	1940	208,971	190,244	29.3	32,636
1936	150,571	141,486	24.6	19,000	1941*	228,524	212,940	32.1	38,604†
	Figures on Monthly Basis								
1940:									
Jan.	19,239	16,341	28.1	27,089	July	14,299	14,539	30.1	27,129
Feb.	17,938	15,629	30.0	27,962	Aug.	17,161	14,464	27.1	28,526
Mar.	17,182	16,200	30.9	27,524	Sept.	16,379	14,835	28.3	29,039
Apr.	16,518	16,573	31.7	26,492	Oct.	19,300	16,807	28.2	30,816
May	17,499	15,984	29.3	27,141	Nov.	17,636	16,312	28.3	31,459
June	16,581	15,163	31.7	27,701	Dec.	19,239	17,397	29.1	32,636
1941:									
Jan.	20,413	19,086	28.9	33,380	July	23,111	21,725	31.6	36,751
Feb.	19,506	18,222	29.1	33,654	Aug.	24,111	20,864	38.7	39,099
Mar.	22,006	19,611	28.4	35,028	Sept.	24,678	24,032	44.8	38,055
Apr.	21,574	20,427	28.6	35,336	Oct.	26,560	25,009	41.4	38,604
May	22,775	21,405	30.0	35,871	Nov.	N.A.	N.A.	...	N.A.
June	23,790	22,559	26.6	36,265	Dec.	N.A.	N.A.	...	N.A.

Note: Figures for 1932 to 1940, inclusive, are based on the annual surveys conducted by the former Leather & Rubber Division of the Bureau of Foreign & Domestic Commerce; figures for 1941 are estimates of the Rubber Manufacturers Association. Publication of figures was discontinued with those of October, 1941, for the duration of the war. (N.A.) Not Available. (*) First 10 monthly only. (†) As of October 31, 1941.

U. S. Consumption of Gasoline

(In Thousands of Barrels of 42 Gallons)

	1939	1940	1941		1939	1940	1941
January	38,089	40,370	45,344	August	54,025	55,346	62,944
February	34,928	37,557	42,001	September	49,505	52,297	58,995
March	43,042	44,607	48,760	October	49,854	53,807	N.A.
April	44,264	47,683	55,154	November	47,407	49,074	N.A.
May	49,766	52,946	59,307	December	43,807	46,413	N.A.
June	50,133	55,459	58,360				
July	50,689	53,865	63,093	Total	555,509	589,424	493,958*

Note: Statistics supplied by the Bureau of Mines. Publication of figures was discontinued with those of September 1941, for the duration of the war. (*) First 9 months only. (N.A.) Not Available.

Rims Inspected and Passed in U. S.

(Tire and Rim Association Reports)

	Total		Total		Total
1930	17,364,096	1934	12,255,116	1938	10,619,338
1931	11,253,800	1935	18,664,107	1939	17,471,914
1932	6,261,336	1936	20,789,504	1940	19,378,558
1933	8,713,962	1937	22,257,798	1941	25,193,698
1941		1941		1941	
January ...	2,032,121	May	2,407,864	September .	1,811,267
February ..	2,131,211	June	2,308,986	October ...	2,023,781
March	2,665,961	July	2,061,144	November .	1,864,321
April	2,682,225	August	1,534,032	December ..	1,676,714

Daily Spot Closing Prices of Ribbed Smoked Sheet Rubber—*New York Market, in Cents per Pound*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Ave
1939																																
October		20	19½	19½	19½	19½	19		19	19½	19½		19½	19½		19½	20½	20½	20½	20½	20½		20½	20	20½	20						19½
November	.20½	20½	20½	20½	20½	20½		20½	20½	20½	20½		20½	20½	20			20	20	20	20									20½		20½
December	.20	20		19½	19½	19½	19½	19½	19½		20½	20½	20½	20½	20½	20½		20½	20½							20½						20
1940																																
January		19½	19½	19½	19½	19½	18½		19½	19½	19½	19½	19½	19½			19½	19½	19½	19		19½	18½	18½			18½	18½	18½	18½	18½	19
February		18½	18½	18½	18½	18½	18½		18½	19½	18½	18½	19½	19½			19½	19½	19½	18½		19½	18½	18½			18½	18½	18½	18½	18½	18½
March		18½	18½	18½	18½	18½	18½		18½	18½	18½	18½	18½	18½			19½	19½	19½	18½		19½	18½	18½			18½	18½	19½	18½	18½	19
April		18½	18½	18½	18½	18½	18½		18½	18½	18½	18½	18½	18½			19½	19½	19½	18½		19½	19½	19½			19½	19½	19½	19½	19½	19½
May		19½	20	20½	20½	19½	20		20½	24	23½	23½	23½	24			22½	22½	22½	20	21	20½	20	20½			20½	21¼	20½	21	21	21¼
June		22	21½	21½	21½	21¼	21¼		21½	22½	23½	22¾	22¾	23½			22½	22¾	22¾	23	23	22¾	22¾	22¾			22	21¾	21¾	20½	20	21¾
July		21½	20½		21½	21¼	21¼		20½	20½	20½	21¼	21¼	22		21	19½	22¾	19½	19½	19½	22¾	22¾	19½			19½	19½	19½	19½	19½	19½
August		19½			19½	19½	19½		19½	19½	19½	20½	19½	19½		19½	19½	19½	19½	19½	19½	19½	19½	19½			19½	19½	19½	19½	19½	19½
September		19½	19½	19½	19½	19½	19½		19½	19½	19½	21¼	21¼	21¼		19½	19½	19½	19½	19½	19½	19½	19½	19½			19½	19½	19½	19½	19½	19½
October		19½	19½	19½	19½	19½	19½		19½	19½	19½	21¼	21¼	21¼		19½	19½	19½	19½	19½	19½	19½	19½	19½			19½	19½	19½	19½	19½	19½
November		20½	20½	20½	20½	20½	20½		20½	20½	20½	21¼	21¼	21¼		19½	19½	19½	19½	19½	19½	19½	19½	19½			19½	20½	20½	20½	20½	20½
December		20½	20½	20½	20½	20½	21		21	21	21	21	21	21		21	20½	20½	20½	21	20½	20½	21¼	20½			20½	20½	20½	20½	20½	21
1941																																
January		20½	20½	20½	20½	20½	20½	20½		20½	20½		20½	20	20½	19½	19½	19½	19½	19½	19½	19½	19½	19½			19½	19½	19½	19½	19½	19½
February			19½	19½	19½	19½	19½	19½		20½	20½		20½	20½	20½	19½	19½	19½	19½	19½	19½	21	21	21			21	21	21	20½	20½	20½
March		20½	20½	21½	21½	21½	21½	19½		21½	21½		22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½			22½	22½	22½	22½	22½	22½
April		22½	22½	22	22½	22½	22½	22		22½	22½		23½	23	23½	23½	23½	23½	23½	23½	23½	23½	23½	23½			23½	23½	23½	23½	23½	23½
May		24	23½	23½	23½	24	24	24		24	24		24½	24½	24½	24½	24½	24½	24½	24½	24½	24½	24½	24½			24½	24½	24½	24½	24½	24½
June		23½	21½	22½	22½	22½	22½	21½	21½	21½	21½	22½	21½	21½	21½	22	22½	21½	21½	21½	21½	22½	22½	22½			22½	22½	22½	22½	23	22½
July		21½	21½	21½	21½	21½	21½	21½	21½	21½	21½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½			22½	22½	22½	22½	23½	22½
August		21½	21½	23	23	23	23	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½	22½			22½	22½	22½	22½	23½	22½
September		22½	22½	23½	23½	23½	23½	23½	23½	23½	23½	23½	23½	23½	23½	23½	23½	23½	23½	23½	23½	23½	23½	23½			23½	23½	23½	23½	23½	23½
October		22½	22½	23½	23½	23½	23½	23½	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24			24	24	24	24½	24½	24
November		22½	22½	23½	23½	23½	23½	23½	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24			24	24	24	24½	24½	24
December		23½	23½	23½	23½	23½	23½	23½	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24			24	24	24	24½	24½	24
1942																																
January		24½	—	—	24½	24½	24½	24½	24½	—	—	24½	24½	24½	24½	24½	—	—	24½	24	23½	24	24	—	23¾	23½	23	23½	23½	23½	—	24

Average Spot Closing Prices—Ribbed Smoked Sheets

(New York Markets)

Average Price per Pound for Years 1913-1932

Year	Cents	Year	Cents	Year	Cents	Year	Cents	Year	Cents
1914	65.33	1918	60.15	1922	17.50	1926	48.50	1930	11.98
1915	65.85	1919	48.70	1923	29.45	1927	37.72	1931	6.17
1916	72.50	1920	36.30	1924	26.20	1928	22.48	1932	3.49
1917	72.23	1921	16.36	1925	72.46	1929	20.59	1933	5.96

Average Monthly Price per Pound Since 1933

	1934 Cents	1935 Cents	1936 Cents	1937 Cents	1938 Cents	1939 Cents	1940 Cents	1941 Cents
Jan.	9.32	13.10	14.35	21.37	14.63	15.75	19.06	19.88
Feb.	10.45	12.92	15.48	21.33	14.71	15.93	18.83	20.43
Mar.	11.01	11.51	15.89	24.09	13.55	16.26	18.58	22.17
Apr.	12.10	11.55	15.98	23.44	11.84	15.87	19.16	22.74
May	13.26	12.05	15.62	21.14	11.57	16.07	21.21	23.90
June	13.51	12.57	15.85	19.29	12.57	16.37	22.20	21.88
July	14.60	12.10	16.49	18.86	15.37	16.51	21.12	22.19
Aug.	15.47	11.98	16.25	18.37	16.08	16.67	19.62	22.70
Sept.	15.36	11.55	16.46	18.55	16.15	21.24	19.28	22.57
Oct.	13.96	12.62	16.55	16.28	16.89	19.89	20.33	23.10
Nov.	13.04	13.15	17.97	14.60	16.24	20.21	21.04	23.14
Dec.	12.98	13.28	20.01	15.41	16.05	20.01	20.76	24.04
Average for Year	12.92	12.37	16.41	19.39	14.64	17.57	20.10	22.40

London Closing Prices of Ribbed Smoked Sheets

(In Pence Per Pound)

Day	1941 May	1941 June	1941 July	1941 Aug.	Day	1941 May	1941 June	1941 July	1941 Aug.
1	14	——	——	——	16	14 7/16	——	——	
2	14	——	——	——	17	——	——	——	
3	——	13 7/16	——	——	18	——	——	——	
4	——	13 1/2	——	——	19	14	——	——	
5	——	13 9/16	——	——	20	13 15/16	——	——	
6	——	13 9/16	——	——	21	13 7/8	——	——	
7	——	——	——	——	22	13 7/8	——	——	
8	——	——	——	——	23	13 1/2	——	——	
9	——	——	——	——	24	——	——	——	
10	——	——	——	——	25	——	——	——	
11	——	——	——	——	26	13 1/16	——	——	
12	——	——	——	——	27	13 1/8	——	——	
13	——	——	——	——	28	13 3/8	——	——	
14	——	——	——	——	29	13 3/8	——	——	
15	14	——	——	——	30	13 5/16	——	——	
					31	——	——	——	

Note: No quotations have been made on the London Exchange since June 6.

Average Monthly Price Per Pound

Month	1938 Pence	1939 Pence	1940 Pence	1941 Pence	Month	1938 Pence	1939 Pence	1940 Pence	1941 Pence
Jan.	7.077	7.926	11.793	12.415	Aug.	7.841	8.545	12.818	
Feb.	7.029	7.942	12.577	12.769	Sept.	7.918	9.634	11.964	
Mar.	6.590	8.120	11.651	13.967	Oct.	8.355	10.177	11.813	
Apr.	5.793	7.910	10.980	14.228	Nov.	8.111	11.210	11.801	
May	5.632	8.002	11.600	13.670	Dec.	8.005	11.559	11.963	
June	6.147	8.216	13.046	——	Average for Year	7.164	8.959	12.035	
July	7.464	8.271	12.410	——					

Spot Closing Cotton Prices

(Middling Upland Grade—New York Market)

Recent Daily Price Per Pound

Date	1942 Jan.	1942 Feb.	1942 Mar.	Date	1942 Jan.	1942 Feb.	1942 Mar.	Date	1942 Jan.	1942 Feb.	1942 Mar.
1	——	——		11	——	19.86		22	20.28	——	
2	18.99	19.58	20.19	12	19.74	——		23	20.59	——	
3	19.13	19.74	20.28	13	19.61	20.04		24	20.58	20.20	
4	——	19.87	20.18	14	19.62	20.07		25	——	20.06	
5	19.17	19.97	20.19	15	19.74	——		26	20.87	20.09	
6	19.23	20.07	20.15	16	19.68	20.12		27	20.96	20.16	
7	19.23	20.01	20.19	17	19.71	20.20		28	20.44	20.24	
8	19.21	——	——	18	——	20.20		29	20.49	——	
9	19.32	20.14	20.15	19	19.71	20.14		30	20.49	——	
10	19.36	19.92		20	19.85	20.30		31	20.10	——	
				21	19.92	20.07					

Average Monthly Price Per Pound

	1939 Cents	1940 Cents	1941 Cents	1942 Cents		1939 Cents	1940 Cents	1941 Cents	1942 Cents
Jan.	8.94	11.19	10.66	19.85	Aug.	9.30	9.84	17.06	
Feb.	8.97	11.10	10.87	20.07	Sept.	9.30	9.69	17.94	
Mar.	9.00	10.90	11.08		Oct.	9.24	9.62	17.31	
Apr.	8.87	10.89	11.48		Nov.	9.73	9.97	17.21	
May	9.56	10.33	12.97		Dec.	1097	10.18	18.09	
June	9.88	10.72	14.66		Average for Year	9.46	10.40	14.66	
July	9.71	10.42	16.55						

Stocks of Crude Rubber

(All figures are in long tons)

ON HAND OR AFLOAT TO THE U. S.

End of	ON HAND 1939	1940	1941	AFLOAT 1939	1940	1941	TOTAL 1939	1940	1941
Jan.	220,727	139,304	309,411	48,210	90,285	153,169	268,937	229,589	462,580
Feb.	207,882	129,023	320,372	55,814	112,257	136,955	263,696	241,280	457,327
Mar.	201,752	134,871	338,147	55,981	113,619	140,228	257,733	248,490	478,375
Apr.	188,074	152,645	329,767	57,918	102,557	153,484	245,992	255,202	483,251
May	187,980	148,881	359,234	54,046	109,364	147,459	242,026	258,245	506,693
June	173,493	154,313	339,108	51,274	119,138	175,499	224,767	273,451	514,607
July	165,450	175,455	395,216	52,990	139,629	132,304	218,440	315,084	527,520
Aug.	152,029	194,760	446,008	66,717	141,286	90,591	218,746	336,046	536,599
Sept.	136,824	220,597	473,684	68,310	137,888	141,756	205,134	358,485	615,440
Oct.	119,404	235,353	454,711	100,500	166,837	172,633	219,904	402,190	627,344
Nov.	105,205	250,412		114,044	158,095		219,249	408,507	
Dec.	125,800	288,864		91,095	145,950		216,895	434,814	

Note: Above figures include stocks held by United States Government.

STOCKS OUTSIDE REGULATED AREAS

(Figures from the International Rubber Regulation Committee)

1940	Singapore and Penang	Para and Manaos	United Kingdom	United States	Total
November	33,778	3,697	30,000*	276,943	344,418
December	26,773	2,165	35,000*	318,486	382,424
1941					
January	37,145	2,151	40,000*	309,411	388,707
February	46,888	2,510	40,000*	320,372	409,795
March	41,005	1,200	40,000*	338,147	420,352
April	42,065	2,205	40,000*	329,767	414,057
May	44,593	1,768	40,000*	364,107	450,485
June	43,263	915	40,000*	339,108	423,286
July	41,534	1,063	40,000*	395,216	477,813
August	44,920	1,145	40,000*	446,008	532,073
September	32,997	1,772	40,000*	473,684	548,453
October	48,399	2,048	40,000*	454,711	545,158

* Estimated.

STOCKS INSIDE REGULATED AREAS

(Figures from the International Rubber Regulation Committee)

1940	Malaya	N.E.I.[1]	Ceylon [1]	Other *	Total
November	43,693	39,267	11,675	3,997	98,632
December	48,787	48,622	11,850	4,124	113,383
1941					
January	47,198	45,137	13,196	4,329	109,860
February	55,512	48,795	14,677	4,064	123,048
March	44,522	48,534	13,841	4,210	111,107
April	53,237	46,787	14,432	4,009	118,465
May	46,511	49,184	14,444	3,772	113,911
June	46,758	51,354	11,908	4,432	114,452
July	49,666	56,352	13,595	4,113	123,726
August	46,558	55,601	12,444	4,003	118,606
September	46,299	48,667	13,052	2,140	110,158
October	50,325	.....	14,366	3,961	.....

([1]) Estates and Dealers. (*) Estimated.

RUBBER STOCKS AFLOAT

	Afloat for United States	Afloat for Europe	All Other Afloat	Total Afloat
End of: 1940				
August	141,286	55,000	53,714	255,000
September	137,033	60,000	67,967	265,000
October	166,837	60,000	38,163	265,000
November	158,095	60,000	31,905	250,000
December	145,950	60,000	44,050	250,000
End of: 1941				
January	153,169	60,000	51,831	265,000
February	136,955	60,000	48,045	245,000
March	140,228	60,000	59,772	260,000
April	153,484	60,000	61,516	275,000
May	147,459	60,000	47,541	255,000
June	175,499	60,000	39,501	275,000
July	132,304	60,000	47,696	240,000
August	90,591	60,000	.....	.....

Note: *Total Afloat* figures are estimated at 1½ months' world shipments by the International Rubber Regulation Committee. *Afloat for U. S.* is supplied by the Rubber Manufacturers Association. *Afloat for Europe* is estimated. *All Other Afloat* is determined by subtraction.

TOTAL WORLD STOCKS

At End of:	1936	1937	1938	1939	1940	1941
January	600,479	454,249	549,762	497,665	433,841	753,021
February	599,355	445,265	565,833	479,578	429,551	769,193
March	583,318	447,856	586,666	460,723	447,472	783,737
April	567,172	428,249	586,291	438,252	465,345	765,521
May	541,871	413,134	568,158	429,979	470,981	777,429
June	520,255	434,250	573,136	407,640	500,774	771,229
July	519,074	445,782	580,654	418,639	547,708	799,934
August	500,520	457,462	565,394	397,345	579,119	859,329
September	493,585	470,768	551,447	396,867	631,888	.....
October	486,159	479,398	540,976	413,274	651,775	.....
November	466,491	493,266	512,196	395,217	659,308	.....
December	466,576	545,533	482,852	391,125	702,089	.....
Monthly Avge.	528,738	460,022	555,280	427,192	543,321	.....

Note: Figures prior to 1941 represent principal world stocks only, as supplied by the Department of Commerce. Figures since 1941 represent total world stocks, as compiled by the Commodity Exchange, Inc.

U. S. Tire and Tube Statistics[1]

(All Figures Represent Thousands)

AUTOMOBILE CASINGS

Production Figures on Quarterly Basis

Quarter	1934	1935	1936	1937	1938	1939	1940	1941
Jan.-Mar.	13,437	13,355	11,376	15,565	7,314	13,946	14,896	16,334
Apr.-June	13,565	12,597	14,892	15,834	7,380	13,759	15,636	18,308
July-Sept.	9,822	11,312	14,914	12,207	10,794	15,182	13,877	15,123
Oct.-Dec.	10,406	12,099	14,858	9,704	12,360	14,726	14,777	11,768
Total	47,230	49,363	56,040	53,310	37,848	57,613	59,186	61,533

Shipment Figures on Quarterly Basis

Quarter	1934	1935	1936	1937	1938	1939	1940	1941
Jan.-Mar.	10,730	11,154	10,554	14,143	7,388	12,445	12,791	15,264
Apr.-June	14,998	13,473	15,940	15,741	9,564	15,107	17,595	21,276
July-Sept.	11,648	13,489	14,037	13,106	11,243	15,791	12,904	18,104
Oct.-Dec.	9,310	12,066	12,855	10,495	12,098	14,165	15,484	12,519
Total	46,686	50,182	53,386	53,485	40,293	57,508	58,774	66,163

Inventory Figures [2]

Quarter	1934	1935	1936	1937	1938	1939	1940	1941
Jan.-Mar.	11,651	11,675	8,762	12,004	10,547	9,963	10,789	10,149
Apr.-June	10,219	10,755	7,556	12,081	8,337	8,632	8,871	7,088
July-Sept.	8,419	8,288	8,690	11,200	7,859	8,080	9,837	5,154
Oct.-Dec.	9,455	8,196	10,717	10,383	8,166	8,665	9,127	4,417

Figures for Recent Months

	PRODUCTION 1940	1941	1942	SHIPMENTS 1940	1941	1942	INVENTORY [2] 1940	1941	1942
Jan.	4,955	5,487	1,461	4,274	4,850	1,231	9,352	9,797	4,643
Feb.	4,916	5,162		4,144	4,896		10,137	10,029	
Mar.	5,025	5,686		4,373	5,518		10,789	10,149	

AUTOMOBILE INNER TUBES

Production Figures on Quarterly Basis

Quarter	1934	1935	1936	1937	1938	1939	1940	1941
Jan.-Mar.	12,823	12,553	11,891	15,831	7,314	12,383	12,801	15,349
Apr.-June	13,191	11,631	14,624	15,413	7,380	11,847	13,703	17,584
July-Sept.	10,321	11,270	15,320	12,038	10,794	13,118	12,425	13,858
Oct.-Dec.	9,891	12,425	15,201	9,092	12,360	13,300	13,308	10,591
Total	46,226	47,879	57,036	52,374	37,848	50,648	52,237	57,382

Shipment Figures on Quarterly Basis

Quarter	1934	1935	1936	1937	1938	1939	1940	1941
Jan.-Mar.	10,640	11,252	11,367	14,606	7,387	11,422	11,683	14,264
Apr.-June	14,553	11,928	15,113	15,495	9,564	13,010	14,978	18,576
July-Sept.	11,545	13,251	15,069	12,901	11,243	13,449	11,344	15,490
Oct.-Dec.	8,306	11,636	12,874	9,765	12,099	13,309	14,209	11,359
Total	45,044	48,067	54,423	52,767	40,293	51,190	52,214	59,689

Inventory Figures [2]

Quarter	1934	1935	1936	1937	1938	1939	1940	1941
Jan.-Mar.	10,244	10,406	8,660	11,993	10,547	8,752	8,110	8,069
Apr.-June	8,795	10,050	8,075	11,833	8,337	7,549	6,848	7,010
July-Sept.	7,639	7,565	8,595	11,326	7,859	7,206	7,970	5,431
Oct.-Dec.	9,180	8,231	10,945	10,312	8,166	7,306	7,017	4,678

Figures for Recent Months

	PRODUCTION 1940	1941	1942	SHIPMENTS 1940	1941	1942	INVENTORY [2] 1940	1941	1942
Jan.	4,199	5,112	1,377	3,761	4,473	1,261	7,417	7,633	4,757
Feb.	4,207	4,887		3,805	4,610		7,828	7,924	
Mar.	4,395	5,349		4,117	5,182		8,110	8,069	

[1] These figures are based on reports received from the Rubber Manufacturers Association. They are revised frequently and the latest available issue should be consulted for most reliable figures.
[2] Stocks held by manufacturers at end of period indicated.

Automobile Production

Year	United States Total	Passenger Cars	Trucks	Canada Total	Passenger Cars	Trucks	Grand Total
1930	3,355,986	2,814,452	540,534	154,192	125,442	28,750	3,510,178
1931	2,389,730	1,973,090	416,640	82,621	63,477	19,144	2,472,351
1932	1,370,678	1,135,493	235,187	60,816	50,718	10,098	1,431,494
1933	1,920,057	1,573,512	346,545	65,924	53,855	12,069	1,992,126
1934	2,753,111	2,177,919	575,192	116,852	92,647	24,205	2,869,963
1935	3,946,934	3,252,244	694,690	172,877	135,562	37,315	4,119,811
1936	4,454,115	3,669,528	784,587	162,159	128,369	33,790	4,616,274
1937	4,808,974	3,915,889	893,085	207,463	153,046	54,417	5,016,437
1938	2,489,085	2,000,985	488,100	166,086	123,761	42,325	2,655,171
1939*	3,577,292	2,866,796	710,496	155,426	108,369	47,057	3,732,718
1940	4,469,354	3,692,328	777,026	222,984	110,126	112,858	4,692,338
1941	4,838,561	3,744,300	1,094,261	270,431	94,045	176,386	5,108,992
1941							
July *	444,241	343,748	100,493	24,654	3,849	20,805	468,895
Aug.	147,600	78,529	69,071	17,192	3,160	14,032	164,792
Sept.	234,255	167,790	66,465	14,496	2,548	11,948	248,751
Oct.	382,000	295,568	86,432	19,360	5,635	13,725	401,360
Nov.	352,347	256,101	96,246	21,545	7,003	14,542	373,892
Dec.	282,205	174,962	107,243	20,313	6,651	13,662	302,518
1942							
Jan.	238,261	147,858	90,403	21,751	4,249	17,502	260,012
Feb.	.....	.....	.....	.....	.....	.....	.....
Mar.	.....	.....	.....	.....	.....	.....	.....

* Revised.
Note: U. S. figures represent factory sales; Canadian, production.

Exports of Crude Rubber from Principal Producing Countries

(Long Tons)

	BRITISH MALAYA							NETHERLAND INDIES						
	Gross Exports	Imports	Net Exports	Ceylon	India & Burma	Sarawak	British North Borneo	Thailand	Java & Madura	Sumatra E. Coast	Other N.I.	Indo-China	Amazon Valley	All Other	World Total
1923	252,016	70,432	181,584	39,971	6,416	5,705	4,237	1,718	32,930	46,344	57,822	5,067	16,765	7,856	406,415
1924	259,706	108,524	151,182	39,997	7,697	6,699	4,621	2,962	42,446	54,497	80,347	6,688	23,165	9,065	429,366
1925	316,825	158,022	158,803	49,566	10,082	5,424	5,377	5,377	46,757	65,499	120,626	7,881	25,298	13,797	514,487
1926	391,328	151,243	240,085	58,962	9,874	9,155	6,079	4,027	52,186	71,413	121,231	8,203	24,298	16,017	621,536
1927	371,322	182,845	188,477	55,556	11,121	10,927	5,556	5,472	55,297	77,815	142,171	8,645	28,782	15,633	606,474
1928	409,430	149,787	259,643	57,267	10,790	10,087	6,698	4,813	58,848	82,511	121,770	9,548	21,129	10,690	653,794
1929	574,836	163,092	411,744	81,584	11,663	11,077	7,381	5,018	65,990	87,789	134,037	9,696	21,148	6,767	853,894
1930	547,043	133,876	413,167	76,970	10,782	10,309	6,781	4,251	69,755	79,396	115,254	7,665	14,260	5,651	814,241
1931	519,740	125,506	394,234	61,769	8,470	10,451	6,247	4,218	75,952	87,747	116,009	11,696	12,121	3,292	792,203
1932	478,252	92,539	385,713	48,973	3,888	6,960	4,664	3,451	61,312	79,837	85,871	13,883	6,450	1,816	702,818
1933	573,412	167,377	406,035	63,351	4,527	10,874	7,555	7,765	73,851	91,861	149,659	18,394	9,883	2,737	846,312
1934	677,361	211,803	465,558	79,746	10,492	17,233	11,1[illegible]	17,545	87,400	112,058	175,470	20,170	8,903	2,985	1,008,663
1935	590,319	174,652	415,667	54,316	13,968	19,465	8,885	28,327	57,488	78,325	139,297	28,816	11,275	8,745	864,574
1936	520,286	167,799	352,487	49,692	14,724	21,243	8,177	33,702	61,307	84,577	152,205	40,782	14,193	11,466	845,431
1937	681,638	213,446	468,192	70,353	17,015	25,922	13,213	5,551	84,085	139,632	207,863	43,399	15,576	13,063	1,133,864
1938	526,911	156,101	370,810	49,528	15,179	17,792	9,512	41,080	57,526	94,501	145,909	58,518	14,618	12,920	887,892
1939	553,324	177,851	375,473	61,026	15,881	24,014	11,864	41,266	72,786	117,791	181,272	65,140	13,892	22,224	1,002,629

	British Malaya[1]	N.E.I.	Ceylon[2]	India & Burma[2]	North Borneo	Sarawak	Thailand	Indo-China	Oceania	Africa[3]	Liberia	South America	Mexico (Guayule)	Grand Total
1940	540,417	536,740	88,894	23,317	17,623	35,166	43,940	64,437	2,267	10,103	7,223	17,601	4,106	1,391,834
1940:														
Sept.	58,892	44,009	9,985	1,319	1,743	2,404	3,247	9,303	100	800	323	1,295	200	133,715
Oct.	52,767	50,139	8,127	1,841	1,693	2,564	3,355	2,082	200	800	600	1,860	200	126,228
Nov.	36,045	37,387	5,623	2,626	1,130	3,360	3,463	6,715	200	800	600	1,500	200	99,649
Dec.	56,263	35,325	10,700	3,405	1,028	3,520	5,343	9,000	200	600	813	1,427	392	128,216
1941:														
Jan.	37,804	58,593	7,859	1,486	2,085	2,445	2,137	9,058	333	667	750	2,103	288	125,608
Feb.	27,115	42,091	4,332	1,421	1,686	2,922	4,137	1,995	96	854	828	1,814	414	89,705
Mar.	56,651	53,233	6,073	1,770	1,154	3,726	5,712	6,286	117	636	958	2,835	355	139,506
Apr.	40,590	48,915	6,985	1,661	2,175	3,118	4,271	....	263	864	750	2,009	423	112,024
May	53,062	48,099	7,638	1,831	1,237	3,849	1,841	6,225	156	800	180	1,080	334	126,332
June	51,247	48,496	8,925	1,056	986	3,195	2,831	7,318	200	800	919	1,510	250	127,733
July	53,373	53,429	7,387	939	1,803	3,799	3,614	3,445	200	800	750	1,253	250	131,042
Aug.	46,404	51,890	9,081	725	1,812	3,086	4,852	6,496	200	800	750	1,288	250	127,634
Sept.	70,598	65,496	6,706	145	1,371	2,495	6,524	8,000	200	800	750	1,421	250	164,756
Oct.	31,101	54,038	8,315	1,563	2,264	3,044	3,074	6,000	200	800	750	2,149	250	113,548

(1) Including Brunei and Labuan; figures shown represent rubber which has actually been shipped and include rubber from the free stocks in Singapore and Penang. (2) Exports of domestic produce. (3) Exclusive of Liberia. Notes: Figures shown prior to 1940 were furnished by the United States Department of Commerce. Figures since 1940 were furnished by the International Rubber Regulation Committee, which accounts for the difference in the principal producing countries shown. Many figures for current months are provisional only and are later revised when more definite statistics are available. Therefore, it is suggested that figures from the most recent issue should be taken as more reliable.

Net Imports of Crude Rubber into Principal Manufacturing Countries

(Long Tons)

	United States[1]	United Kingdom	France (h)	Germany	Canada (ac)	Japan (da)	Italy	Russia (ce)	Australia (cd)	Belgium (d)	Netherlands	Scandinavia (abcdf)	Spain (g)	Czechoslovakia (abcd)	Total
1919	238,407	42,671	17,685	5,584	6,395	9,753	9,894	75	1,002	3,995	2,771	3,149	2,418	9	343,809
1920	249,530	56,844	13,885	11,890	11,746	5,297	6,123	62	1,815	2,840	5,510	2,292	2,008	567	371,409
1921	179,736	42,087	15,135	21,920	8,124	21,713	3,906	165	1,014	1,705	1,022	1,279	2,245	569	300,620
1922	296,594	11,724	24,352	27,546	9,207	15,934	6,430	2,493	2,643	172	—3,807	1,778	589	567	396,222
1923	301,527	12,700	27,392	18,519	13,277	15,372	8,489	2,986	1,649	2,184	792	2,528	630	1,128	409,173
1924	319,103	—11,550	30,446	22,727	14,299	19,571	8,764	2,346	3,124	2,688	—807	3,178	944	1,370	416,203
1925	385,596	4,061	32,956	33,937	19,683	11,117	11,412	7,088	4,757	2,930	975	3,149	1,155	1,558	520,274
1926	399,981	84,865	34,240	22,775	20,229	18,125	9,809	6,529	9,021	2,498	2,670	4,046	1,296	1,870	617,957
1927	403,472	60,249	34,271	38,892	26,405	20,521	11,381	12,018	9,490	6,482	636	4,224	2,055	2,672	632,768
1928	407,572	4,846	36,498	37,855	30,447	25,621	12,433	15,134	8,430	7,958	2,243	4,418	3,178	3,138	599,771
1929	528,608	122,675	55,093	49,275	35,453	34,284	17,169	11,774	15,886	9,445	3,022	6,440	864	4,650	894,639
1930	458,036	120,069	68,503	45,488	28,793	33,039	18,639	16,387	5,354	10,635	2,924	7,710	2,400	4,468	822,445
1931	475,993	86,170	46,466	39,688	25,261	43,483	10,149	30,671	7,649	11,009	2,220	6,360	2,605	7,717	794,641
1932	393,844	44,086	42,506	45,121	20,917	36,027	14,469	30,637	12,576	9,519	2,851	7,262	4,359	9,444	693,618
1933	398,365	73,335	61,953	54,120	19,332	66,831	19,341	29,830	13,534	11,166	1,243	7,831	5,520	10,402	772,803
1934	439,172	158,482	49,560	59,330	28,439	69,905	21,398	47,271	9,642	9,115	3,758	12,418	6,900	10,999	926,389
1935	455,758	128,829	51,450	62,899	26,870	57,567	21,880	37,572	9,978	7,593	4,068	11,878	8,140	11,245	895,727
1936	475,359	—2,591	57,032	71,794	27,871	61,223	16,534	30,967	14,109	9,648	2,888	11,236	6,668	8,772	791,510
1937	592,394	92,707	59,871	98,170	36,088	62,311	24,733	30,462	19,164	14,970	4,343	4,680	2,400	13,063	1,055,356
1938	406,343	133,079	59,660	90,200	25,696	45,836	28,170	25,650	11,944	11,309	5,092	16,034	2,400	9,936	871,349
1939	486,348				31,615	42,352			15,426	9,612	7,051				
1940	811,564														
1940:															
Feb.	41,797	7,500	5,000*	....	3,508	5,241	1,500*	2,000*	1,846	694	495	1,200*	200*	....	....
Mar.	58,302	14,200	5,000*	....	3,062	6,057	1,500*	2,000*	1,784	....	627	1,200*	200*	....	....
Apr.	70,135	16,400	5,000*	....	3,096	2,000*	1,500*	2,000*	1,612	....	....	1,200*	200*	....	....
May	50,610	10,000	5,000*	....	3,108	2,500*	1,500*	2,000*	2,128	....	....	1,200*	200*	....	....
June	53,266	9,500	5,000*	....	1,062	3,000*	1,500*	2,000*	1,181	....	....	1,200*	200*	....	....
July	69,496	19,500	5,000*	....	5,112	3,000*	1,500*	2,000*	1,902	....	....	1,200*	200*	....	....
Aug.	72,612	21,250	5,000*	....	4,605	4,500*	1,500*	2,000*	2,508	....	....	1,200*	200*	....	....
Sept.	78,306	25,940	5,000*	....	2,743	....	1,500*	2,000*	2,485	....	....	1,200*	200*	....	....
Oct.	74,400	.....	5,000*	....	8,336	....	1,500*	2,000*	590	....	....	1,200*	200*	....	....
Nov.	72,775	.....	5,000*	....	5,451	....	1,500*	2,000*	1,366	....	....	1,200*	200*	....	....
Dec.	97,794	.....	5,000*	....	7,437	....	1,500*	2,000*	721	....	....	1,200*	200*	....	....
1941:															
Jan.	86,541	.....	5,000*	....	6,290	....	1,500*	2,000*	1,065	....	....	1,200*	200*	....	....
Feb.	73,647	.....	5,000*	....	3,770	....	1,500*	2,000*	1,717	....	....	1,200*	200*	....	....
Mar.	86,794	.....	5,000*	....	3,879	....	1,500*	2,000*	3,486	....	....	1,200*	200*	....	....
Apr.	64,521	.....	5,000*	....	2,531	....	1,500*	2,000*	2,326	....	....	1,200*	200*	....	....
May	101,034	.....	5,000*	....	5,596	....	1,500*	2,000*	1,549	....	....	1,200*	200*	....	....
June	64,101	.....	5,000*	....	2,818	....	1,500*	2,000*	1,373	....	....	1,200*	200*	....	....
July	96,658	.....	5,000*	....	4,143	....	1,500*	2,000*	2,003	....	....	1,200*	200*	....	....
Aug.	105,556	.....	5,000*	....	10,683	....	1,500*	2,000*	1,251	....	....	1,200*	200*	....	....
Sept.	81,742	.....	5,000*	....	....	....	1,500*	2,000*	4,392	....	....	1,200*	200*	....	....

a—Including gutta percha. b—Including balata. c—Re-exports not deducted in monthly statistics. d—Including some scrap and reclaimed rubber. e—Official statistics of rubber imports by Soviet Russia. f—Including Norway, Sweden, Denmark and Finland. g—United Kingdom and French exports to Spain except in years prior to 1925. h—French imports have been reduced in order to eliminate imports of gutta percha and to reduce to basis of net weight. [1]—United States imports of guayule are included in this compilation. *—Figure is provisional; final figure will be shown when available.

NOTE: ANNUAL FIGURES ARE MORE ACCURATE: THEY ARE REVISED AT THE END OF THE FOLLOWING YEAR.

The WHERE-TO-BUY Section of THE RUBBER AGE in which are listed the Products and Services of the Leading Suppliers to the Industry.

The Market Place

If what you are seeking is not listed here, write to the Service Department of THE RUBBER AGE, 250 West 57th St., New York, N. Y.

Chemicals and Compounding Materials —

ACCELERATOR Z 51
- Good Aging Properties
- Free from Rapid Overcure
- Safe Processing Properties
- Low Dosages for Optimum Cures

Advance Solvents & Chem. Corp.
245 Fifth Ave. New York, N. Y.

CAMELINE WHITE CALCITE **FILLER**
99.75% 325 mesh, more than 90% minus 25 microns; soft, thin, platy particles, assuring better tensile, flexing and elongation.
HARRY G. HOEHLER
YORK, PA.

CATALPO—The universal and standard rubber pigment now being used in treads, solids, tubes, carcass frictions, etc.
Moore & Munger
33 Rector Street New York City

ACCELERATORS—
El-Sixty; Ureka; Ureka C; Guantal; Santocure; RN-2 Crystals; DPG; Pip Pip; A-32; A-100; R-2 Crystals; A-10 • ANTIOXIDANTS — Flectols B, H, White; Santoflex B; Santovar A.
MONSANTO CHEMICAL CO.
Rubber Service Dept.
1012 Second National Bldg., Akron, Ohio

CARBON BLACK— *Micronex*
the world's standard gas black, universally known as the "King of Rubber Pigments."
Binney & Smith Co.
41 East 42nd St. New York City

CHEMICALS
Carbon Black—Clay—Colors
Accelerators—Sulphur
Stocks Carried At All Times
Ernest Jacoby & Co.
79 Milk St. Boston, Mass.
Cable Address: Jacobite Boston

AERO BRAND
RUBBER CHEMICALS
DPG—DOTG—Accelerator 49
Rubber Sulphur
American Cyanamid & Chemical Corporation
30 Rockefeller Plaza, New York, N. Y.

CARBON BLACK
CONTINENTAL
The Newest Name in Carbon Black offers
CONTINENTAL DUSTLESS
CONTINENTAL COMPRESSED
CONTINENTAL UNCOMPRESSED
Continental Carbon Company
295 Madison Ave., New York, N.Y.

CHEMICALS

For Rubber		For Industry Generally
Accelerators	*Acids*	*Latex*
Antioxidants	*Oil of Myrbane*	*Lotol*
Specialties	*Aniline Oil*	*Dispersions*

NAUGATUCK CHEMICAL
Division of United States Rubber Co.
1230 SIXTH AVE. NEW YORK

ALUMINUM FLAKE
A uniform, fine, low gravity, white reinforcing pigment. *Furnished to the rubber trade for 39 years.*
The Aluminum Flake Co.
Akron, Ohio

CARBON BLACK— *Aerfloted*
Arrow Black for rubber compounding. Standard for grit-free uniformity.
J. M. Huber, Inc.
460 West 34th St. New York

CHEMICALS AND MINERAL
Ingredients—Whiting, Clay, Tale, Barytes, Colors. Heavy Calcined Magnesia. Carbonate of Magnesia, Pumice Stone.
Standard Since 1820
Whittaker, Clark & Daniels, Inc.
260 West Broadway New York

ALUMINUM HYDRATES
"Alorco" Hydrated Aluminas reinforcing pigments give many desirable properties to rubber. Send for sample.
ALUMINUM CO. OF AMERICA
1970 Gulf Bldg. Pittsburgh, Pa.

CARBON BLACK
"Atlantic" Carbon Blacks meet the exacting standards of modern rubber production.
Chas. Eneu Johnson & Co., Mfrs.
Distributed by
C. P. HALL CO.
Akron — Boston — Los Angeles — Chicago

CHEMICALS
A complete line of plasticizers, resins, substitutes, fillers, etc., for Synthetic, Natural and Reclaimed Rubber.
STANDARD CHEMICAL COMPANY
Akron Savings & Loan Bldg, Akron

ANTIMONY Pentasulphide, golden and crimson, very fine, pure.
Rare Metal Products Co.
Belleville, N. J.
Direct Factory Representation

CARBON BLACK
DIXIE...KOSMOS
Used throughout the world
UNITED CARBON COMPANY
Charleston, W. Va.
New York • Akron • Chicago

CHEMICALS
For Natural & Synthetic Rubber
"PICCO" Brand—Plasticizers; Coumarone Resins; Reclaiming Oils, Coal Tar Naphthas.
Pennsylvania Industrial Chem. Corp.
Clairton Penna.

CALCENE—The Ideal low gravity, white reinforcing pigment. Gives high tensile and elongation properties with exceptionally good resistance to tear and abrasion.
PITTSBURGH PLATE GLASS CO.,
COLUMBIA CHEMICAL DIV.
30 Rockefeller Plaza, New York, N. Y.

CARBON BLACK
WITCO DISPERSO
and DUSTLESS and a
Complete Line of High Quality
Rubber Chemicals
Wishnick-Tumpeer, Inc.
295 Madison Ave., New York, N.Y.

COAL TAR CHEMICALS

Coumarone Resins	Tack Producers
Resinous Oils	Dispersing Oils
Reclaiming Oils	Softeners

Solvents
The Neville Company
Neville Island, Pittsburgh, Penna.

The Market Place

The WHERE-TO-BUY Section of THE RUBBER AGE in which are listed the Products and Services of the Leading Suppliers to the Rubber Industry. If what you are seeking is not listed here, write to the Service Department of THE RUBBER AGE, 250 West 57th St., New York, N. Y.

Chemicals and Compounding Materials (continued)

COLLOIDAL SULPHUR
COLLOIDAL ZINC OXIDE
COLLOIDAL COLORS

HEVEATEX CORPORATION
78 Goodyear Ave. Malrose, Mass.
Offices in New York, Akron, Chicago

FACTICE—Prevents blooming, makes colors fast and a smoother batch.

Stamford Rubber Supply Co.
Stamford, Conn.

PARA-FLUX
The Universal Softener—Adaptable, Uniform. Improves Quality—Economical.

The C. P. Hall Co.
2510 First Central Tower
Akron Ohio

COLORS
BRILLIANT ORGANIC DYES; PERMANENT, NON-BLEEDING, LOW COST
For All Cures

MONSANTO CHEMICAL CO.
Rubber Service Dept.
1012 Second National Bldg., Akron, Ohio

FURNEX—FURNEX BEADS
—A cool mixing reinforcing black for Footwear and Mechanicals. Good ageing —Improved oil resistance.

Binney & Smith Co.
41 East 42nd St. New York City

PELLETEX (The pellet *Gastex*)
The special process reinforcing black in free-flowing form. Saves power; none wasted; protects adjacent colored stocks.

GENERAL ATLAS CARBON DIV.,
GENERAL PROPERTIES CO., INC.
60 Wall St. New York

COMPOUNDING Materials

Vulcanizing Agents	Pigments
Accelerators	Clays
Antioxidants	Mineral Rubber
Plasticizers	Aromatics
Dispersions	Blacks

R. T. VANDERBILT CO.
230 Park Ave. New York City

GASTEX
Special Process Reinforcing BLACK. Superior aging and oil resistant properties. Low permanent set.
GENERAL ATLAS CARBON DIV.,
GENERAL PROPERTIES CO., INC.
60 Wall St. New York

RUBBER PROCESSING OILS
For outstanding compatibility in processing natural or modern synthetic rubbers, use
SUN RUBBER PROCESSING OILS
Write
SUN OIL COMPANY
Philadelphia Pennsylvania

CROWN CLAY
An Approved Clay for Rubber Compounding

Southeastern Clay Co.
Aiken South Carolina

IRON OXIDES
Asbestine—Barytes—Talc—Soapstone

C. K. Williams & Co.
EASTON, PA.

RUBBER SUBSTITUTES
White, brown and black.

The Carter Bell Mfg. Co.
Springfield, New Jersey

CUMAR —Paracoumarone Resin.
A neutral gum for rubber compounding.
Samples and prices on request.
The Barrett Div.
Allied Chemical & Dye Corp.
40 Rector St. New York City

MAPICO COLORS
Pure Oxides of Iron
Yellows—Reds—Browns—Black
MAGNETIC PIGMENT CO.
Manufacturers
BINNEY & SMITH CO.
Distributors
41 East 42nd Street, New York, N. Y.

SOFTENERS
Rosin Oil — Pine Tar
Burgundy Pitch
"Galex" — a non-oxidizing Resin
National Rosin Oil & Size Co.
RKO Bldg. New York, N. Y.

DU PONT Rubber Chemicals
DU PONT RUBBER COLORS
DU PONT ACCELERATORS
DU PONT ANTI-OXIDANTS
E. I. du Pont de Nemours & Co., Inc.
RUBBER CHEMICALS DIVISION
WILMINGTON, DELAWARE

MOLD LUBRICANT
"Orvus" enables articles to leave molds readily; molds clean easily. Effective in hardest water. Also acts as thorough cleanser for molded and extruded rubber goods.
PROCTER & GAMBLE
Cincinnati Ohio

SOLVENTS
"Skellysolve"—A superior solvent in six different types for various uses—for making rubber cements—for many different rubber fabricating operations.
SKELLY OIL CO., SOLVENTS DIV.
Skelly Bldg., Kansas City, Mo.

EXTENDER
NAFTOLEN R 100 — Extender for Crude Rubber, Reclaim, Synthetics.
Wilmington Chemical Corporation
Wilmington Delaware

PARA-DORS—
overcome odors in rubber—effectively and at low cost.
GIVAUDAN-DELAWANNA, INC.
Industrial Aromatics Division
330 West 42nd St., New York, N. Y.

YOUR PRODUCTS
Should be displayed in
THE MARKET PLACE
Show What You Have to Sell

The Market Place

The WHERE-TO-BUY Section of THE RUBBER AGE in which are listed the Products and Services of the Leading Suppliers to the Rubber Industry. If what you are seeking is not listed here, write to the Service Department of THE RUBBER AGE, 250 West 57th St., New York, N. Y.

Chemicals and Compounding Materials (continued)

STEARIC ACID
STEAREX . . . CAKE or POWDER
STEAREX BEAD
Standardized Products for Rubber Compounding
MINERAL RUBBER (Parmr), TALC
SOAPSTONE
Binney & Smith Co.
41 East 42nd St. New York City

WAXES
Johnson's lustrous wax finishes retard oxidation, reduce friction, surface wear, tackiness.
S. C. JOHNSON & SON, INC.
Racine Wisc.

ZINC OXIDE PIGMENTS
The XX Reds Kadox
ZINC SULPHIDE PIGMENTS
The Cryptones The Albaliths (Lithopones)
The New Jersey Zinc Sales Co.
New York Chicago
Cleveland, Boston, San Francisco

SULPHURS
Rubbermakers' TIRE BRAND and TUBE BRAND. Also CRYSTEX Insoluble Sulphur, Sulphur Chloride, Caustic Soda, Carbon Bi-Sulphide, Carbon Tetra-Chlorids.
Stauffer Chemical Company
2710 Graybar Bldg., New York City

ZINC OXIDES
AZO ZZZ Zinc Oxides
lead free—pure—uniform—dependable
AZO ZZZ-11 AZO ZZZ-55
AZO ZZZ-22 AZO ZZZ-44 AZO ZZZ-66
American Zinc Sales Company
Columbus, Ohio New York
Chicago St. Louis

ZINC OXIDES
Black Label Red Label Green Label
Manufactured by Our New Electrothermic Process
St. Joseph Lead Co.
250 Park Ave., New York
Plant and Laboratory: Monaca (Josephtown), Pa.

TITANIUM PIGMENTS
TITANOX-A (Titanium Dioxide)
TITANOX-B (Titanium Barium Pigment)
TITANOX-C (Titanium Calcium Pigment)
TITANOX-L (Lead Titanate)
TITANIUM PIGMENT CORP.
SELLING AGENTS
111 Broadway, New York, N. Y.
104 S. Michigan Ave., Chicago, Ill.

The Progressive Concern Selling to Rubber Manufacturers Uses THE MARKET PLACE for Results

ZINC STEARATE
ZINC LAURATE
Colite Mold Lubricant for Extra High Gloss
THE BEACON COMPANY
87 Bickford St., Boston, Mass.

Machinery and Equipment

BANBURYS REPAIRED
Re-building and re-surfacing rotors and mixing chambers has been our specialty for years.
INTERSTATE WELDING SERVICE
914 Miami St. Akron, Ohio

DIAL GAUGES—Thickness
For measuring the thickness of rubber and similar materials. Many models.
Frank E. Randall
248 Ash St.,
Waltham Mass.

GRINDING MILLS
SPAN grinding mill reduces soft and hard rubber to fine powder.
Made in U. S. A.
M. Pancorbo
155 John St. New York, N. Y.

CALENDER SHELLS
Gammeter's
ALL STEEL Calender Shells.
All welded. Any size.
New and better.
The W. F. GAMMETER CO.
Cadiz Ohio

DRYING MACHINERY
For Synthetic Rubber, Reclaimed Rubber, Latex Processed Materials, etc.
PROCTOR & SCHWARTZ, INC.
Seventh St. & Tabor Rd. Philadelphia, Pa.

MACHINERY
L. ALBERT & SON
Trenton, N. J. Akron, O.
Los Angeles, Calif.

CUTTING DIES
Cutting and perforating dies of all types for rubber manufacturers.
Send for our quotations
Brockton Cutting Die & Machine Co.
Avon, Mass.

EXTRUDERS
The pioneer line of tubers, strainers and wire insulating machines. For latest developments inquire of
JOHN ROYLE & SONS
Paterson New Jersey

MACHINERY—RUBBER
"MASTER" Tube Molds, Tire Vulcanizers, Molds and Cores, Tire Drums, Tubers, etc.
Special Machinery Built to Order
Akron Standard Mold Co.
Akron, Ohio

CUTTING MACHINERY
Specialists in Rubber Cutting Equipment for Bands, Crude Stock, Jar Rings, Tubes, Rollers, Washers, Treads, Cement Stock, etc.
See Black Rock for All Cutting Problems
Black Rock Manufacturing Co.
179 Osborne St. Bridgeport, Conn.

FORMS - PORCELAIN
Exclusive Manufacturers of Vitreous Porcelain Closed End Forms
No matter what shape or design—we can make it. Send blue print or sketch for our prices.
The Colonial Insulator Co.
936 Grant St. Akron, Ohio

MACHINERY
Cutting, Trimming, Skiving, Cementing, Eyeletting, Cutting Dies—Eyelets.
United Shoe Machinery Corp.
140 Federal St., Boston, Mass.

The Market Place

The WHERE-TO-BUY Section of THE RUBBER AGE in which are listed the Products and Services of the Leading Suppliers to the Rubber Industry. If what you are seeking is not listed here, write to the Service Department of THE RUBBER AGE, 250 West 57th St., New York, N. Y.

Machinery and Equipment {continued}

MAGNETIC EQUIPMENT of All Kinds
Separators, Clutches, Rolls, Drums, Brakes, Special Magnets
Stearns Magnetic Mfg. Co.
640 So. 28th St., Milwaukee, Wis.

SPECIAL MACHINERY
For Quality and Efficiency in Working Rubber. Consult us about your problems.
Utility Manufacturing Co.
Cudahy, Wisconsin

WEATHER-OMETER
Atlas Twin-Arc Weather-Ometer duplicates outdoor weather conditions. Economical—dependable—efficient.
ATLAS ELECTRIC DEVICES CO.
349 W. Superior St. Chicago, Ill.

MANDRELS—All Types
Circular and Straight—Aluminum and Steel Licensed Under Clyde E. Lowe Co. Patents
Sherardizing and Chrome Plating Machinery—Air Bag & Mandrel Polishing
National Sherardizing & Machine Co.
Hartford, Conn. Akron, Ohio

STOCK SHELLS
A Type for Every Need—Large Diameter—Light Weight — Extra Strong — Seamless.
National Sherardizing & Machine Co.
Hartford, Conn. Akron, Ohio

WEATHERING UNIT
The National X-1-A Accelerated Weathering Unit quietly evaluates substitute materials, new formulas, established products.
NATIONAL CARBON CO., INC.
Carbon Sales Div.
Cleveland, Ohio

MOLDS
For tires, rubber specialties and mechanical goods; general machine work.
The Akron Equipment Co.
Akron, Ohio

TESTING MACHINES
RUBBER TENSILE TEST MACHINES
TEXTILE TESTING MACHINES
Write for Descriptive Literature
Henry L. Scott Co.
P. O. Box 963 Providence, R. I.

WHAT DO YOU WANT TO SELL?
Whether it is vulcanizers, gauges, dies, molds, mills or calenders, a card in this space will help you. Buyers consult these pages—put your products before them!

Rubber—Crude; Scrap; Latex; Dispersions

CREPE RUBBER
Specialists in Latex Crepe
Charles F. Connor & Co., Inc.
110 State St., Boston, Mass.
Telephone: LAFayette 3690

CRUDE RUBBER
LIQUID LATEX
Members of the Commodity Exchange, Inc., and Commodity Exchange Rubber Clearing Ass'n., Inc.
Charles T. Wilson Co., Inc.
120 Wall St. New York
AKRON OFFICE: 803 United Building

LATEX
Normal, Concentrated, Processed
HEVEATEX CORPORATION
78 Goodyear Ave., Melrose, Mass.
Offices in New York, Akron, Chicago

CRUDE RUBBER
LATEX, BALATA
GUTTA-PERCHA, GUTTA-SIAK
Robert Badenhop Corporation
Woolworth Bldg., New York City

CRUDE RUBBER PERMITS
Our long experience ideally equips us for the prompt, efficient handling of Manufacturers' Crude Rubber Purchase Permits.
Baird Rubber & Trading Co., Inc.
233 Broadway New York, N. Y.

LOTOL
(Compounded Latex)
Ready to use
NAUGATUCK CHEMICAL
Division of United States Rubber Co.
Rockefeller Center, New York, N. Y.
Offices in Detroit, Boston, Indianapolis

CRUDE RUBBER
SCRAP RUBBER
Also HARD RUBBER DUST
H. Muehlstein & Co., Inc.,
122 E. 42nd St., New York City
BRANCHES: Akron, Chicago, Boston Detroit, Los Angeles, London, Paris

DISPERSITE
Water Dispersed Rubber
(Reclaimed—Crude—Synthetics)
Man-made Alternate for Latex
Dispersions Process, Inc.
1230 Sixth Ave., New York, N. Y.
Offices in Detroit, Boston, Indianapolis

REVERTEX
Highly Concentrated (About 75%)
Rubber Latex
Sole Distributor for U. S. A. and Canada
Revertex Corp. of America
37-08 Northern Blv'd., L. I. City, N. Y.

CRUDE RUBBER
SCRAP RUBBER
HARD RUBBER DUST
BALATA — GUTTA PERCHA
Hermann Weber Company
67 Broad St., New York

GUAYULE "Duro" Brand and AMPAR Rubber, washed and dried ready for compounding.
High Grade PLANTATION RUBBER from our own Estates
Continental Rubber Co. of N. Y.
745 Fifth Avenue New York

RUBBER
Crude Rubber
Liquid Latex
Ernest Jacoby & Co.
79 Milk St. Boston, Mass.
Cable Address: Jacobite Boston

The Market Place

The WHERE-TO-BUY Section of THE RUBBER AGE in which are listed the Products and Services of the Leading Suppliers to the Rubber Industry. If what you are seeking is not listed here, write to the Service Department of THE RUBBER AGE, 250 West 57th St., New York, N. Y.

Rubber [Cont'd]

RUBBER—
Scrap and Crude
Also HARD RUBBER DUST
A. Schulman, Inc.
Darrow Road, Akron, Ohio
1401 Mississippi Ave., E. St. Louis, Ill.
736 Statler Bldg., Boston, Mass.
Warehouses at Akron and E. St. Louis

VULTEX— THE ONLY VULCANIZED LATEX
Insures Highest Quality, Uniformity, Economy, Simplicity of Application.
FULLY PROTECTED BY PATENTS
Also Latex and Latex Compounds
General Latex & Chemical Corp.
Successors to the Vultex Chemical Company
666 Main St. Cambridge, Mass.

The Progressive Concern Selling to Rubber Manufacturers Uses THE MARKET PLACE for Results

Reclaimed Rubber . . . .

NERVASTRAL RECLAIMING PROCESSES
HIGH GRADE — HIGH SPEED
HIGH ECONOMY
Rubber & Plastics Compounds Co., Inc.
30 Rockefeller Plaza, New York, N. Y.
Tel: COlumbus 5-0085

RECLAIMED RUBBER—
For All Purposes
NAUGATUCK CHEMICAL
Division of United States Rubber Co.
1230 Sixth Ave., N. Y. City

RECLAIMED RUBBER—
Uniformity, reliability, cleanliness
Pequanoc Rubber Co.
Butler, N. J.

RECLAIMED RUBBER—
A standardized grade for every requirement.
U. S. Rubber Reclaiming Co., Inc.
500 Fifth Ave., New York, N. Y.
"59 Years Serving the Industry Solely as Reclaimers"

Rubber—Synthetic

HYCAR
For extreme resistance to heat, abrasion, oil, gasoline, aging, and deterioration.
HYCAR CHEMICAL COMPANY
335 South Main St.
Akron Ohio

NEOPRENE
In different types to meet stringent requirements.
The Neoprene Notebook carries up-to-date information on neoprene. Ask for it.
E. I. du Pont de Nemours & Co., Inc.
Rubber Chemicals Div.
Wilmington Del.

PERBUNAN
Oil Resistance—Heat Resistance
Long Life
Full information upon request.
STANCO DISTRIBUTORS, INC.
26 Broadway New York, N. Y.

THIOKOL
Synthetic rubber available in several types, including powder form. Excellent heat and solvent resistance.
THIOKOL CORPORATION
Trenton N. J.

YOUR PRODUCTS
Should be displayed in
THE MARKET PLACE
Show What You Have to Sell

Miscellaneous

VINCULUX
Metal Conditioner; Rust Inhibitor; Bonding "Catalyst"
Saves Money—Eliminates Sandblasting and Pickling! Stops Corrosion! Improves Bonding!
Gallon, $5; Money back if not pleased.
PROTECTIVE COATINGS, INC.
10393 Northlawn Detroit, Mich.

VULCANIZER PAINT
Protect your vulcanizer interiors with "Bonnejohn" paint—resists acids, abrasion, heat, oxidation.
Belke Manufacturing Co.
947 N. Cicero Ave., Chicago, Ill.

Fabrics—Liners, Hollands

CUSTOM FINISHERS of
RUBBER REPELLENT LINERS
Capitol Process Liner Treatment
—
Textile Proofers, Inc.
One Gates Ave. Jersey City, N. J.

LINERS TREATED
Advantages of Porotex Treatment
1. All Compounds stripped easily. 2. Wrinkles never cause liners to crack. 3. Prevents rot; liners rendered heat and oil-proof. 4. Liners remain porous, reducing tendency to trap air.
POROTEX PRODUCTS
875 East 140th St. Cleveland, Ohio

PROCESSED LINERS
"CLIMCO"—Fabrics treated to prevent adhesion of rubber stocks.
"LINERETTE"—Treated paper for separating or interleaving light weight rubber stocks.
The Cleveland Liner & Mfg. Co.
5508 Maurice Ave., Cleveland, Ohio

Consultants

CONSULTING
LATEX TECHNOLOGIST
R. J. Noble, Ph.D.
21 Woodland Road, Malden, Mass.

CONSULTING
Rubber Technologist
R. R. Olin Laboratories
P. O. BOX 372. AKRON. OHIO
Telephones: Sherwood 3724, Franklin 8551

Rubber Mnfrs.

MECHANICAL MOLDED RUBBER GOODS
Sponge Rubber: Sheeted—Die Cut—Molded
Your Inquiries Solicited
Barr Rubber Products Co.
Sandusky, Ohio

SANITARY GOODS—
Dress Shields, Baby Pants, Aprons, Elastic Belts, Bloomers, Stepins, Bibs, Guimps and Brassieres.
SPECIAL GOODS CUT TO ORDER
Rand Rubber Co., Inc.
Summer Ave. & Halsey St., Brooklyn, N. Y.

INDEX TO ADVERTISERS

Advance Solvents & Chemical Corp. ... 483
Akron Equipment Co. ... 486
Akron Standard Mold Co. ... 485
Albert & Son, L. ... 485
Aluminum Co. of America ... 405, 483
Aluminum Flake Co. ... 483
Aluminum Ore Co. ... 405, 483
American Cyanamid & Chemical Corp. ... 420, 483
American Resinous Chemicals Corp. ... Outside Back Cover
American Zinc Sales Co. ... 417, 485
Atlas Electric Devices Co. ... 486

Badenhop Corp., Robert ... 486
Baird Rubber & Trading Co., Inc. ... 467, 486
Barr Rubber Products Co. ... 487, 488
Barrett Div., Allied Chemical & Dye Corp. ... 406, 484
Beacon Co. ... 485, 488
Belke Mfg. Co. ... 467, 487
Binney & Smith Co. ... Insert Following 452, 483, 484, 485
Black Rock Mnfg. Co. ... 485
Brockton Cutting Die & Machine Co. ... 485

Carter Bell Manufacturing Co., The ... 475, 484
CLASSIFIED ADVERTISING ... 475
Cleveland Liner & Mnfg. Co. ... 404, 487
Colonial Insulator Co. ... 485
Columbian Carbon Co. ... Insert Following 452, 483, 484
Connor, Charles F., & Co., Inc. ... 486
Continental Carbon Co. ... 419, 483
Continental Rubber Co. ... 486

Dispersions Process, Inc. ... 486
Du Pont de Nemours & Co., E. I. ... Inside Front Cover, 484, 487

Farrel-Birmingham Co., Inc. ... —

Gammeter, W. F., Co. ... 475, 485
General Atlas Carbon Div. ... 484
General Latex & Chemical Corp. ... 487
Givaudan-Delawanna, Inc. ... 484

Hall Co., The C. P. ... 415, 483, 484
Heveatex Corporation ... 418, 484, 486
Hoehler, Harry G. ... 483
Huber, J. M., Inc. ... 483
Hycar Chemical Co. ... 403, 487

Interstate Welding Service ... 416, 485

Jacoby, Ernest, & Co. ... 475, 483, 486
Johnson, Charles Eneu, & Co. ... 415, 483
S. C. Johnson & Son, Inc. ... 473, 485

Magnetic Pigment Co. ... 484
Monsanto Chem. Co. (R. S. Dept.) ... 483, 484
Moore & Munger ... 483
Muehlstein & Co., H., Inc. ... 413, 486

National Carbon Company, Inc. ... 486
National Rosin Oil & Size Co. ... 475, 484
National Sherardizing and Machine Co. ... 476, 486
Naugatuck Chem. Div. U. S. Rubber Co. ... 424, 483, 486, 487
Neville Co. ... 473, 483
New Jersey Zinc Co. ... 485
Noble, R. J. ... 487

Olin Laboratories, The R. R. ... 487

Pancorbo, M. ... 412, 485
Pennsylvania Industrial Chemical Corp. ... 483
Pequanoc Rubber Co. ... 421, 487
Pittsburgh Plate Glass Co., Columbia Chemical Div. ... 483
Porotex Products ... 487
Procter & Gamble ... 468, 484
Proctor & Schwartz, Inc. ... 485
Protective Coatings, Inc. ... 487

Rand Rubber Co. ... 487, 488
Randall, Frank E. ... 466, 485
Rare Metal Products Co. ... 474, 483
Revertex Corp. of America ... 466, 486
Royle & Sons, John ... 414, 485
Rubber & Plastics Compounds Co., Inc. ... 411, 487

St. Joseph Lead Co. ... 407, 485
Schulman, A., Inc. ... Inside Back Cover, 487
Scott Co., Henry L. ... 474, 486
Skelly Oil Co. ... 484
Southeastern Clay Co. ... 476, 484
Stamford Rubber Supply Co. ... 476, 484
Stanco Distributors, Inc. ... 487
Standard Chemical Co. ... 412, 483
Stauffer Chemical Co. ... 408, 485
Stearns Magnetic Mfg. Co. ... 474, 486
Sun Oil Co. ... 422, 484

Textile Proofers, Inc. ... 418, 487
Thiokol Corp. ... 487
Titanium Pigment Corp. ... 485

Union Bay State Co. ... 468
Union Carbide and Carbon Corporation ... 486
United Carbon Co. ... Insert Following 470, 483
United Shoe Machinery Corp. ... 408, 485
U. S. Rubber Co., Naugatuck Chemical Div. ... 424, 483, 486, 487
U. S. Rubber Reclaiming Co. ... 487
Utility Mfg. Co. ... 486

Vanderbilt, R. T., Co. ... Front Cover, 484

Weber, Hermann, Co. ... 486
Whittaker, Clark & Daniels, Inc. ... 476, 483
Williams, C. K., & Co. ... 474, 484
Wilmington Chemical Corp. ... 469, 484
Wilson Co., C. T. ... 486
Wishnick-Tumpeer, Inc. ... 483

BEACON
ZINC STEARATE
ZINC STEARATE
zinc stearate
zinc stearate
THE BEACON COMPANY
89 Bickford St. Boston, Mass.
Monten Wax Replaces Montan In The Rubber Industry

12 Issues a Year
$3.00 Annual Subscription
THE RUBBER AGE

MECHANICAL
MOLDED RUBBER GOODS
Sponge Rubber: Sheeted—Die Cut—Molded
We Solicit Your Inquiries
THE BARR RUBBER PRODUCTS COMPANY
SANDUSKY, OHIO

SINCE 1880 RUBBER GOODS
"They Last Longer" REG. U. S. PAT. OFF.
Rand. REG. U. S. PAT. OFF.
DRESS SHIELDS
DRESS SHIELD LININGS
BABY PANTS
BABY BIBS & APRONS
SANITARY WEAR
RUBBERIZED SHEETING
RUBBER APRONS
STOCKINET SHEETS
RUBBER SHEETS
RAINCAPES & COATS
RUBBER SPECIALTIES
DOLL PANTS, CAPES, ETC.
RUBBER DAM & BANDAGES — SHEET GUM
RAND RUBBER CO. BROOKLYN, N. Y. U. S. A. MFRS.

HUGHES PRINTING CO.
EAST STROUDSBURG, PA.

Big Names in the Roll-Call of American Resources:

WHEAT FOR THE LEGIONS OF DEMOCRACY
SCRAP RUBBER FOR WAR-PRODUCTION

AMERICA'S fertile plains yield the "staff of life" for a population that requires strength and abundant nourishment as never before. Those amber waves of grain are more precious than gold to our embattled nation.

Precious, too, in an industrial way, are the millions of pounds of Scrap Rubber accumulated through years of motorized American living. Our war program calls for the collection and delivery of every available ounce of Scrap Rubber . . . to be reclaimed and used in essential products.

And the Scrap Rubber organization, which moves this resource into the channels of supply, has become an essential part of America's front-line industries.

A. Schulman Inc.

Scrap Rubber

AKRON, OHIO • **EAST ST. LOUIS, ILL.** • **BOSTON, MASS.**

790 E. Tallmadge Ave. 14th & Converse Streets 738 Statler Building

One of To-day's Vital Needs Is to Extend Supplies of Rubber and Latex

• INVESTIGATE

Resin and Lacquer Emulsions

as LATEX SUBSTITUTES

—Extenders and Modifiers

A Few of Our Products of Interest to the Rubber Industry

•

ALKYD 17-B A permanently tacky, alkyd type resin emulsion containing 40% solids. When mixed in equal proportions with normal latex, the mixture for all practical adhesive purposes is indistinguishable from latex.

ALKYD 18 An alkyd type resin emulsion which is non-yellowing and non-oxidizing. Film is water-white and non-tacky. Preferred where slight oxidizing action may be considered harmful to rubber. Extender for latex in coating, combining and impregnating processes.

EMULSION 58-8 A series of emulsified elastomers containing up to 65% solids. Recommended for use as full latex replacements in impregnation and combining.

PIGMENT BASES Concentrated aqueous dispersions of pigments in resin bases, available in all shades and viscosities, suitable for spreading, spraying, etc.

Also Acrylic, Vinyl, Maleic, Phenolic, Hydrocarbon, Ethyl Cellulose, Cellulose Acetate and Nitrate emulsions and solutions for various applications.

Resin and Lacquer Emulsions have been finding an ever-widening use in many industries. They have proved invaluable in replacing other materials in adhesives, modifiers, binders and fillers, grease proofing, waterproofing, sizing, impregnating, coating, color dispersions and innumerable other uses.

In the Rubber Industry these emulsions are being used today as *Latex Modifiers* and *Complete Latex Replacements* to extend, thicken, stabilize, increase penetration, improve resistance to acids, oils and solvents, and to mechanical coagulation, etc.; *in Coatings* to produce adherent pigmented coatings and as intermediate coats for lacquer on rubberized cloth; in *Rubberizing* textiles; in *Latex Treated Papers* to increase strength and improve ageing; in *Adhesives*, for paper, for leather to cloth, and cloth to cloth.

These are just a few of the known applications in the rubber field. Undoubtedly in your own plant you will find many uses for these emulsions to improve your products and extend the supply of the vital materials, LATEX and RECLAIMS.

Our Technical Staff will be glad to make recommendations to meet your specific problems. Write today for additional information.

AMERICAN RESINOUS CHEMICALS CORPORATION

Coatings • Pigment Dispersions • Resin, Wax, Lacquer Emulsions

MAIN OFFICE and LABORATORIES

PEABODY, MASS.

Factory Branches: Newark, N. J. and Chicago, Ill.